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Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                 Result
No.
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Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum DB seq length: 0
Maximum DB seq length: 2000000000
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                                                                                                                                                                                                                                                                                                          Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                           Score
  368
367.5
                                                          1019
456
450
400
376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        April 22, 2003, 17:11:26; Search time 36 Seconds (without alignments) 932.754 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 MSNRLDGKVAIITGGTLGIG......NESKFATGSEFVVDGGYTAQ 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-910-033A-2
1290
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                                                                                                                                                                                                               Match Length DB
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      34
28
28
28
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /SIDS2/gcgdata/geneseq/geneseqp-embl/AA1980.DAT:
                                                                                                                                                                                                                                                                                                                                                                                   /SIDS2/gcgdata/geneseq/geneseqp-embl/AA2001.DAT:*
/SIDS2/gcgdata/geneseq/geneseqp-embl/AA2002.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                             /SIDS2/gcgdata/geneseq/geneseqp-embl
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data/geneseq/geneseqp-embl/AA1985.DAT:
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AAO16940
AAW23407
AAW23409
AAB49773
AAB47522
AAW56815
ABP3717
AAU37095
ABB54214
AAR27757
                                                                                                                                                                                                                                                                        SUMMARIES
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/geneseqp-embl/AA1982.DAT:
/geneseqp-embl/AA1983.DAT:
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                                                                      Lactobacillus brev
Lactobacillus kefi
Protein with acety
(R)-2-octanol dehy
Bacillus D-arabini
                                                                                                                                                                                                           Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .986.DAT:
                  Staphylococcus epi
Staphylococcus aur
Lactococcus lactis
                                                                                                                                                                       Recombinant enzyme
  dehydrogen
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| • | 24 25.1 | 24 25.1 | 24 25.1 | 5.6 | .5 .25.6 | .5 25.6 | .5 25.6 | .5 25.9 | .5 25.9 | .5 26.1 | .5 26.1 | 40 26.4 | 0 26.4 | 26.4 | 40 26.4 | 40 26.4 | 41 26.4 | 44 26.7 | 44 26.7 | 45 26.7 | .5 27.0 | 51 27.2 | .5 27.3 | .5 27.6 | .5 27.8 | .5 27.8 | 27.8 | .5 27.9 | .5 27.9 | .5 28.2 | 28.2 | . 28.2 | 28.3 | .5 2 | 8.4 |
|---|---------|---------|---------|-----|----------|---------|---------|---------|---------|---------|------------|---------|--------|------|---------|---------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|-------------|---------|---------------|------|--------|------|------|----------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2 |
| | AAW06 | | | | | | | | | | 2 AAU37794 | | | | 1 AAB44 | 0 AAY41 | 23 ABP39586 | 3 ABB92 | 1 AAB42 | 2 AAG81 | 3 ABP39 | 2 AAU36 | 2 AAG83 | AAP800 | 1 AAY54 | 1 AAY96 | AAP805 | .3 AAR27756 | | | | | | AAR0 | 3 AAE201 |
| | 488 | 161 | 010 | 415 | 580 | 167 | 228 | 449 | 296 | 086 | 794 | 296 | 108 | 056 | 317 | 761 | 586 | 624 | 558 | 644 | 667 | 267 | 032 | 63 | 424 | 271 | 90 | 756 | 846 | 741 | 740 | 4193 | 018 | 044 | 115 |
| | | | | | | | | | | | | | | | | | | | | | | | | • | • | | . | | | H. ghilianii/ | | | • | • | |

ALIGNMENTS

RESULT 1 AAO16940

AAO16940 standard; Protein; 252

A

AAO16940; 16-MAY-2002

(first entry)

EA HAS SO XXX Location/Qualifiers WPI; 2002-173122/23 Synthetic. NAD(H) acceptance enzyme; reduced nicotinamide-adenine dinucleotide; ketone; alcohol; enantiomerically enriched. Recombinant enzyme with increased NAD(H) acceptance Riebel B, Hummel W, 27-JUL-2000; 2000DE-1037101. 20-JUN-2001; 2001EP-0114953 30-JAN-2002 EP1176203-A1 Unidentified (DEGS) DEGUSSA AG /note= "wild-type Gly substituted by Asp" Bommarius A;

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RESULT 2
AAW23407
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Best Local Similarity
Matches 252; Conserv
WPI; 1997-459831/43
N-PSDB; AAT73132.
                                        Hummel W,
                                                                    (BOEF ) BOEHRINGER MANNHEIM GMBH.
                                                                                                  21-MAR-1996;
                                                                                                                                20-MAR-1997;
                                                                                                                                                                                          EP796914-A2
                                                                                                                                                                                                                                               Alcohol dehydrogenase;
                                                                                                                                                                                                                                                                        Lactobacillus brevis alcohol dehydrogenase
                                                                                                                                                                                                                                                                                                           27-MAR-1998
                                                                                                                                                                                                                                                                                                                                         AAW23407;
                                                                                                                                                                                                                                                                                                                                                                   AAW23407 standard;
                                                                                                                                                                                                                      Lactobacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           acidic amino acid; while retaining the basic amino acid in the co-enzyme binding site. The enzyme can be used to prepare enantiomerically enriched organic compounds, especially enantioselective reduduction of ketones or oxidation of alcohols. The present sequence is the enzyme of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                            241
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The present invention relates to a recombinant enzyme with higher
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         alcohols, has increased nice result of specific mutation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAL45006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (reduced) nicotinamide-adenine dinucleotide) acceptance than the ype, and which has at least one neutral amino acid exchanged for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQEF 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VRVNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATG 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     recombinant enzyme, useful for enantioselective synthesis of e.g.
                                                                                                                                                                                                                                                                                                                                                                                                                                          SEFVVDGGYTAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEFVVDGGYTAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VRVNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF
                                        Riebel B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          252
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Page 7-8;
                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                     brevis
                                                                                                  96DE-4010984.
                                                                                                                             97EP-0104814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                          252
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                                                                                                                                                                                                                                                                                                                                                                   Protein;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23pp; German.
                                                                                                                                                                                                                                           production; (R)-alcohol; (S)-alcohol
                                                                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 1290; DB 23;
Pred. No. 4.3e-117;
Mismatches 0;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
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RESULT 3
AAW23409
ID AAW2
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       dehydrogenase, which retains at least 95% of its activity after 30 cminutes at 20-60 degrees C and can be purified to a specific activity of at least 400 U/mg. The enzyme can be used to produce (R) alcohols by enantioselective reduction of ketones of formula C RI-CO-R2, where R1 and R2 - hydrogen (sic) or 1-20C alkyl, alkenyl, alkenyl, caryl or arylenyl (sic) optionally substituted by halogen, NO2, OH or 1-20C alkoxy, "an optionally substituted by halogen, NO2, OH or its substituted by saturated, unsaturated or aromatic proup, calcohols in throgen, oxygen or sulphur heterocycles, or may be an optionally substituted polycondensed saturated and/or aromatic group" (sic) in the presence of the enzyme or cells containing it at 20-60 degrees of formula R1-CHOH-R2 in the presence of the enzyme or cells containing it at 20-60 degrees containing it at 20-60 degrees
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Local Similarity 99.3
Matches 250; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local :
Misc-difference 50
                                                 Misc-difference
                                                                                                      Misc-difference 48
                                                                                                                                                                                                                                                                                                                                       Alcohol dehydrogenase; production; (R)-alcohol; (S)-alcohol
                                                                                                                                                           Misc-difference 47
                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                             Lactobacillus kefir
                                                                                                                                                                                                                                                                                                                                                                                                 Lactobacillus kefir alcohol dehydrogenase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           27-MAR-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAW23409 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The present sequence is a Lactobacillus brevis alcohol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61 QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pages 24-26; 34pp; German.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                             Location/Qualifiers
                   'note- "not defined
                                                                        /note= "not
                                                                                                                            /note= "not
                                                                                                                                                                                 /note= "not defined in
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Pred. No. 7
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Mismatches
                   'n
                                                                        'n
                                                                                                                            'n
                specification'
                                                                                                                                                                                 specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
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     The present Lactobacillus kefir alcohol dehydrogenase (ADH) was used in the isolation of a L. brevis ADH, which retains at least 95% of its activity after 30 minutes at 20-60 degrees C and can be purified to a specific activity of at least 400 U/mg. The enzyme can be used to produce (R)-alcohols by enantioselective reduction of ketones of formula R1-CO-R2, where R1 and R2 - hydrogen (sic)
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acetylpyridine derivatives
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Best Local
(R)-2-octanol dehydrogenase for producing intermediates for HMG-CoA
                                                                                                                   WPI; 2001-596701/67.
N-PSDB; AAH43472.
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08-DEC-2000; 2000JP-0374593.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            activity. The process is efficient and high yielding asymmetric reduction isomers by suitable manipulation. The method is for the preparation of reducing acetylpyridine ethanol derivatives by stereoselectively polycyclic analogues, for use and also similaring for the preparation of reducing acetylpyridine derivatives, and also similaring for the preparation of polycyclic analogues, for use and also similaring for the preparation of polycyclic analogues, for use and also similaring for the preparation of polycyclic analogues, for use and also similaring for the preparation of t
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              236
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 N-VQYIQADASKEADNEKLISETLSAFGDLDYVCANAGIATFTQTTDISYDVWRKVTSIN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      55
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ESKFATGSEFVVDGGYTAQ 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DQIQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVN 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITD-----RHSDVGEKAAKSVGTP 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAK--GIRVNSVNPGYIKTPLLDICP--KEHMDYLITQHPIGRLGKPEEIASAVAFLCSD
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104; Conserv
                                                                                                                                                                                                                                                          Yamamoto H;
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Pred. No. 5e-36;
""smatches 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         reductase inhibitor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 254;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                co-enzyme;
ate ester;
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RESULT 6
AAY56815
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Matches 101; Conserv
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Best Local
 N-PSDB;
                                              (NIPK ) NIPPON KAYAKU
                                                                                               26-MAY-1998;
                                                                                                                                                            07-DEC:1999
                                                                                                                                                                                            JP11332569-A.
                                                                                                                                                                                                                                                      D-arabinitol dehydrogenase;
                WPI; 2000-091353/08
                                                                                                                             26-MAY-1998;
                                                                                                                                                                                                                                                                                      Bacillus D-arabinitol dehydrogenase
                                                                                                                                                                                                                                                                                                                         31-MAR-2000
                                                                                                                                                                                                                                                                                                                                                         AAY56815;
                                                                                                                                                                                                                                                                                                                                                                                   AAY56815 standard; Protein; 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ($)-4-halo-3-hydroxybutyrate esters are useful as intermediates for HWG-COA reductase inhibitors or D-carnitine. (R)-propoxybenzene derivatives are particularly useful as intermediates for optical isomers of ofloxane (($)-(-)-9-fluoro-3-methyl-10-(4-methyl-1-piperazinyl)-7-oxo-2,3-dihydro-7H-pyrido(1,2,3-de)(1,4) benzoxadin-6-carboxylic acid).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (1) produces ketones by oxidizing alcohol using beta-NAD as a
co-enzyme; and produces alcohols by reducing ketones using beta-NADH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This sequence represents (R)-2-octanol dehydrogenase which has the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      234 ESKFATGSEFVVDGGYTAQ 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180 A--SHGIRVNSVNPGYISTPLIDEVP--KERLDKLVSLHPIGRLGRPEEVADAVAFLCSQ 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            175 ALKDYDVRVNTVHPGYIKTPLVDDLPGAEEAMSQRTKT-PMGHIGEPNDIAYICVYLASN 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 hydroxybutyrate ester
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (2) preferentially oxidizes the optical isomer (R)-2-octanol; and
reduces 4-haloacetoacetate ester to produce (S)-4-halo-3-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     as a co-enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  following characteristics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120 LNGVFLLDKLAINYWLEKSKPGVIVNMGSVHSFVAAPGLAHYGAAKGGVKLLTQTLALEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               115 LDGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDP$LGAYNASKGAVRIMSKSAALDC 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             reductase inhibitors or D-carnitine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60 DNLHYVQADSSKEEDNKKLISETLATFGGLDIVCANAGIGKFAPTHETPFDVWKKVIAVN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               55 DQIQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVN 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITD-----RHSDVGEKAAKSVGTP 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EATFINGVSLPVDGGYTAQ 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MSYNFHNKVAVVTGALSGIGLSVAKKFLQLGAKVTISDVSGEKKYHETVVALKAQNLNT- 59
AAZ46762,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         254 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                             98JP-0143637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                83-85;
                                                                                                                             98JP-0143637
                                              ξ ξ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97pp; Japanese
                                                                                                                                                                                                                                              clinical diagnosis; mycosis.
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AAZ46763

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RESULT 7
ABP38717
ID ABP3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The invention relates to gene encoding D-arabinitol dehydrogenase, isolated from Bacillus sp. IKD-5A868 strain. The protein can be expressed by standard recombinant methodologies. D-arabinitol dehydrogenase is used as a clinical diagnosing agent for mycosis. The present sequence represents the D-arabinitol dehydrogenase enzyme.
Novel isolated nucleic acid encoding a Staphylococcus epidermidis polypeptide, useful for diagnosing and treating bacterial infections
                                                                                                                                                                                              14-AUG-1997;
08-NOV-1997;
                                                                                                                                                                                                                                                                                                                                                                  Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                      Staphylococcus epidermidis; open reading frame; ORF; bacterial infection; antibacterial; gene therapy.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Arabinitol dehydrogenase gene encoding D-arabinitol dehydrogenase useful as a clinical diagnosing agent for mycosis
                                                           N-PSDB; ABN91262
                                                                                                                    Doucette-Stamm
                                                                                                                                                                                                                                                     13-AUG-1998;
                                                                                                                                                                                                                                                                                                                               US6380370-BJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ABP38717 standard; Protein; 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 1; Page 10-11; 14pp; Japanese
                                                                               WPI; 2002-381255/41.
                                                                                                                                                        (GENO-) GENOME THERAPEUTICS CORP
                                                                                                                                                                                                                                                                                           30-APR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Staphylococcus epidermidis ORF amino acid sequence SEQ ID NO:3562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24-JUL-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              243
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        126 MSKAAGKVMIRQGKG-SIINISSMSGLIVNTPQPQAAYNVSKAGVIMLTKSLASEWA--P 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FATGSEFVVDGGYT 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HGVRVNTIAPGYMKTKLTEPYFAAGGEMIDKWLAMTPMGRPGVPHELGGIAVYLASDASS 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YDVRVNTVHPGYIKTPLVDD--LPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESK 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTRLGIQRMKNKGLGASIINMSSIEG-FVGDPS-LGAYNASKGAVRIMSKSAALDCALKD 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAA---KSVGTPDQIQFF 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FATGGVFTIDGGYT 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QTDVTDEAQVEALIRQVEEQYGRLDVLVNNAGIVHKDRAEELPYETWNRVMNVNLNSVFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RLDGRVTIVTGAGMGLGRAMALALAQAGSHIVIADIRADEAQEAANEIRSCGV--EATVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      258 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                  LA,
                                                                                                                                                                                            97US-055779P.
97US-064964P.
                                                                                                                                                                                                                                                                                                                                                                  epidermidis
                                                                                                                                                                                                                                                     98US-0134001
                                                                                                                Bush D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31.0%;
39.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 400; DB 21;
Pred. No. 1.4e-30;
11; Mismatches 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ABN90538 to ABN93374 represent Staphylococcus epidermidis open reading frame (ORF) nucleic acid sequences which encode the amino acid sequences given in ABP35124 to ABP37960. The S. epidermidis sequences have antibacterial activity and can be used in gene therapy. The sequences can also be used in the diagnosis and treatment of bacterial infections, particularly S. epidermidis infections. The sequences can be used to screen for compounds able to interfere with the S. epidermidis life cycle or inhibit S. epidermidis infection.

N.B. The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the
                                                                                                                                                           21-MAR-2000;
23-MAY-2000;
                                                                                                                                                                                                              21-MAR-2001;
                                                                                                                                                                                                                                              27-SEP-2001
                                                                                                                                                                                                                                                                               WO200170955-A2
                                                                                                                                                                                                                                                                                                                  Staphylococcus aureus
                                                                                                                                                                                                                                                                                                                                                   Antisense; prokaryotic cellular proliferation protein; antibiotic; antibacterial; drug design.
                                                                                                                                                                                                                                                                                                                                                                                                    Staphylococcus aureus cellular proliferation protein #1265
                                                                                                                                                                                                                                                                                                                                                                                                                                          14-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU37095 standard; Protein; 272 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Disclosure;
                                  (ELIT-) ELITRA PHARM INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USPTO web site.
                                                                                                       27-NOV-2000;
                                                                                                                          23-OCT-2000;
                                                                                                                                      26-MAY-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         131 AQTVGRQMIEKGSG-SMINVSSVLGLIANKTQDQSSYETSKAGVTMLTKSLAREWS--RY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     188 GIKVNAIAPGYMRT-----IETEKILNDNTETNTTPMERVGEPEELAGITVYLASDASS 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 TRLGIQRMKNKGLGASIINMSSIEGFVGDPS--LGAYNASKGAVRIMSKSAALDCALKDY 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              71 LDITHLDEVNQIVDYVVREYGKIDILVNNASISIQDDTENISYEEWLKEINLSLNGAFSV 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11 KLTGKVAMVIGGATGIGKAMAEALAQAGANIVIADLQSNIGQETATTISTQSGVKTTSLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4 RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQ--FFQ 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FATGSEFVVDGGYTA 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FTQGSVFNIDGGYSA 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DVRVNTVHPGYIKTPLVDDLPGAEEAMSQRTK---TPMGHIGEPNDIAYICVYLASNESK 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFG 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         257 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQ ID 3562; 267pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                              2001WO-US09180.
                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                     2000US-253625P
2000US-257931P
                                                                                                                        2000US-242578P
                                                                                                                                          2000US-206848P.
2000US-207727P.
                                                                                                                                                                         2000US-191078P
Ohlsen Ki,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    29.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 59; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 376; DB 2
Pred. No. 3e-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
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6.

Haselbeck R,

Zyskind JW,

Wall D,

Trawick JD,

Carr

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RESULT 9
ABB54214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GC genes, their use in the discovery of novel antiblotics, the essential CC genes themselves and the encoded proteins. The prokaryotes used are CC Escherichia coli, Stabhylococcus aureus, Salmonella typhi, Klebsiella CC invention is also useful for the identification of potential new targets CC for antiblotic development. The antisense nucleic acids can also be used CC to identify proteins used in proliferation, to express these proteins CC and to obtain antibodies capable of binding to the expressed proteins. CC The proteins can be used to screen compounds in rational drug discovery CC programmes. The antisense nucleic acid sequence is also useful to screen CC for homologous nucleic acids which are required for cell proliferation in CC a wide variety of organisms. The present sequence represents an CC Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic CC format directly from Wipo at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                 FR2807446-A1
                                                                    Lactococcus lactis IL1403
                                                                                                              Biosynthesis;
                                                                                                                                                 Lactococcus lactis protein butA.
                                                                                                                                                                                             16-MAY-2002
                                                                                                                                                                                                                                    ABB54214;
                                                                                                                                                                                                                                                                      ABB54214 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                              238
                                                                                                                                                                                                                                                                                                                                                                                                                     235
                                                                                                                                                                                                                                                                                                                                                                                                                                                             178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ftp.wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example 3; Seq ID No 12688; 511pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New polynucleotides for the identification and development antibiotics, comprise sequences of antisense nucleic acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prokaryotic cellular proliferation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yamamoto RT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63 IASEQQIDNFASEIREQFGHYDVLFNNAGYDNAAGR-IHEYPTDYYDKIMNVDMRGTFLM 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ù
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4 RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFFQHD
                                                                                                                                                                                                                                                                                                                                                                          SSFITGETIRIDGGVMA 254
                                                                                                                                                                                                                                                                                                                                                                                                                                              RANAIAPGTIETPLVDKLTGTSEDKEGKAFRENQKWMTPLGRLGKPEEVGKLVVFLASDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TKMMLPLMMTK--GGSIVNTSSFSGQAADLYRSGYNAAKGAVINFTKSIAIEYG-RD-GI 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDV 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSDEDGWTKLEDATEKAFGPVSTLVNNAGI--AVNKSVEETTTAEWRKLLAVNLDGVFFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       invention relates to antisense inhibitors
                                                                                                                                                                                                                                                                                                                                                                                                               SKFATGSEFVVDGGYTA 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RVNTVHPGYIKTPLVDDLPGAEE------AMSQRTKTPMGHIGEPNDIAYICVYLASNE 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          272 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                (first entry)
                                                                                                          biodegradation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28.68;
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                                                                                                                                                                                                                                                                        253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 369; DB 22;
Pred. No. 1.6e-27;
$2; Mismatches 109
                                                                                                     lactic bacterium; yogurt; cheese.
                                                                                                                                                                                                                                                                      AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                inhibitors of genes essential their use in identifying the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 272;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ō,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
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                                                                                                                                                                                                                                                                                                     RESULT 10
AAR27757
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 28.5
Best Local Similarity 34.3
Matches 86; Conservative
                Misc-difference 96
                                                                        Bacillus megaterium
                                                                                                                  GDH; mutant;
                                                                                                                                                            Glucose
                                                                                                                                                                                                 11-MAR-1993
                                                                                                                                                                                                                                         AAR27757;
                                                                                                                                                                                                                                                                            AAR27757 standard; protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               production of yogurt and cheese.

Note: The sequence data for this patent is based on equivalent patent wo200177334 (published 18-OCT-2001) which is available in electronic format directly from WIPO at ftp.wipo.int/pub/published_pct_sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The present invention is related to a Lactococcus lactis nucleotide sequence (ABA90521) and related proteins (ABB53300-ABB55621). The nucleic acid sequence is useful in the detection and/or amplification of nucleic acid sequence, particularly to identify Lactococcus lactis or related species.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 related species. The proteins of the invention are useful for the biosynthesis or biodegradation of a composition of interest. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11-APR-2000; 2000FR-0004630
                                                                                                                                                                                                                                                                                                                                                                                    239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              invention helps research in lactic bacteria, particularly useful in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New nucleotide sequence useful in lactis and related species -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bolotine A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (INRG ) INRA INST NAT RECH AGRONOMIQUE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                     238 ATGSEFVVDGG 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               128 RMKNKGLGASIINMSSIEGEVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVRVNTVH 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  · 3 KIAAVTGAGQGIGFAIAKRLYNDGFKVAIIDYNEETAQKAAKELG--ENSFAIKADVSDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68 DGWTKLEDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTRLGIQ 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       '8 KVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDOIQFFQHDSSDE 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PGYIKTPLVDDL------PGAEEAMSQRT---KTPMGHIGEPNDIAYICVYLASNESKF 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LFRKLGHGGKIINATSQAGVVGNPNLMLYSSSKFAVRGMTQIAARD--LAEEGITVNAYA 178
                                                                                                                                                                                                                                                                                                                                                                                ITGQTIIVDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGIVKTPMMFDIAHQVGKNAGKDDEWGMQTFAKDIAMKRLSEPEDVANVVSFLAGPDSNY 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EQVISALNAVVDKFGDLNVVVNNAGIAPTTQIETITPEQFHQVYNINVGGVLWGTQTSTA 120
                                                                                                                                                       dehydrogenase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              253 AA;
                                                                                                                recombinant; mass production;
                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ID No 916;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2000FR-0004630.
                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2504pp; French.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Renault P,
                                                                                                                                                                                                                                                                              261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 368; DB 23; Pred. No. 1.8e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches 103;
                                                                                                                                                                                                                                                                              ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the identification or Lactococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ehrlich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 23;
                                                                                                                tetramer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SD;
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Indels

14;

Gaps

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60

/note=

"site of Glu->Val or Lys mutation'

thermostable

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RESULT 11
AAE20115
ID AAE20
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AC AAE20
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The glucose dehygrogenase enzyme is encoded by a recombinant DNA clone from Bacillus megaterium. The DNA sequence may be mutated site directed mutagenesis to introduce mutations to the protein sequence (see feature table). The DNA may be used to transform E
                 AAE20115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence (see feature table). The DNA may be used to transform E coll cells, and transformants may be cultured to mass produce GDH. The mutant GDH is not influenced by ion strength, exists as a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Glucose dehydrogenase prepn. using transformed recombinant DNA from Bacillus megaterium - has specified transformations giving glucose dehydrogenase-expressing vector, introduced into E.coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13-FEB-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                             AAE20115 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tetramer and is thermostable.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for culture
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (AMAN ) AMANO PHARM KK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    13-FEB-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-SEP-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JP04258293-A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                   237
                                                                                                                                                                   236
                                                                                                                                                                                                     179
                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                                                                                                                                                                                                  59
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                 KFATGSEFVVDGGYT
                                                                                                                                                                                                                                                                                   GVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCAL 176
                                                                                                                                                                                                                                                                                                                               AIAVKGDVTVESDVINLVQSXIKEFGKLDVMINNAGXENPVSSHEMSLSDWNKVIDTNLT 118
                                                                                                                                   SYVTGITLFADGGMT
                                                                                                                                                                                              K--GIRVNNIGPGAINTPINAEKFADPEQRADVESMIPMGYIGEPEEIAAVAAWLASSEA 236
                                                                                                                                                                                                                              KDYDVRVNTVHPGYIKTPL-VDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNES
                                                                                                                                                                                                                                                               GAFLGSREAIKYFVENDIKGTVINMSSVHEKIPTPLFVHYAASKGGMKLMTETLALEYAP 178
                                                                                                                                                                                                                                                                                                                                                                                               MYKDLEGKVVVITGSSTGLGKXMAIRFATEKAKVVVNYRSKEXEANSVLEEIKKVG--GE
                                                                                                                                                                                                                                                                                                                                                                                                                              MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAA----KSVGTPDQ 56
                                                                                                                                                                                                                                                                                                                                                              IQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLD 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 Similarity
85; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Page 8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91JP-0106927.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    91JP-0106927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=
43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note=
253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note-
22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12pp; Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label- Leu,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28.5%;
                                                                                                                                  251
                                                                                                                                                               250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "site of Gln->Leu mutation"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Asp,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ser,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ala,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    49;
                                              261 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Met
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 367.5;
Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Glu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Αla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of Tyr->Glu.mutation*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5; DB 13;
2.1e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
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                                                                                                                                                                                                                               235
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1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMIT--DRHSDVGEKAAKSVGTPDQIQ 58

Query Match Best Local :

85; Conserv

Conservative

50;

Score 366.5; Pred. No. 2.6e 50; Mismatches

.6e-27 DΒ 112; 23;

Indels Length

7;

Gaps

4

28.4%;

Sequence

261 AA

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XX
                                  carcinogenic agent. The present sequence is Lactobacillus rhamnosus acetoin dehydrogenase butA. The EC number for acetoin dehwdrogenase 1.1.1.5.
                                                                                                                                                                                                                                                                                                                                                                                                                          " sequence present in Lactobacillus rhamnosus strain HN001 and encoding a polypeptide capable of modifying the flavour, aroma, texture, nutritional and health benefits of milk-derived products, and/or survivability of microbes in dairy manufacture.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New polynucleotides and polypeptides from Lactobacillus rhamnosus, useful in e.g. improving the flavor, aroma, texture and health-related benefits of milk-derived products, or in increasing properties of microbes -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (GENE-)
                                                                                                                        allergies; treatment of allergic responses to foods; reduction of blood lipids and prevention of heart disease; anthypertensive effect; prevention and treatment of urogenical infections, Helicobacter pylori, or hepatic encephalopathy; treatment of inflammatory bowel disorder and irritable bowel syndrome; modulation of endocarditis; and for improved
                                                                                                                                                                                                                                                                                                                                                              microbes in dairy manufacturing processes. The polynucleotides are useful for improving the properties of microbes used in the manufacture of milk-derived products such as cheeses, yogurt, fermented milk products, sour milks and buttermilk; in modifying the flavour, aroma, texture and health
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08-AUG-2000;
28-NOV-2000;
                                                                                        protein and carbohydrate utilization and conversion. microbial population can be administered to a mammal
                                                                                                                                                                                                                                           diarrhoea; aid in lactose digestion; as anti-cancer and anti-mutagenesis; liver cancer reduction; reduction of small bowel bacterial overgrowth;
                                                                                                                                                                                                                                                                                                                       related benefits of milk-derived products and in increasing the survival of microbes during industrial fermentation processes. The bacteria may be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim 11; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Glenn M, Havukkala IJ, Blo
Christensson AC, Holland R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-AUG-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO200212506-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Lactobacillus rhamnosus HN001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    infantile diarrhoea; lactose digestion; anti-cancer; autoimmune disorder; anti-mutagenesis; immune system modulation; allergy; Helicobacter pylori; antihypertensive effect; urogenical infection; hapatic encephalopathy; bowel syndrome; endocarditis; transgenic microbe; acetoin dehydrogenase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lactobacillus rhamnosus acetoin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18-JUN-2002
                                                                                                                                                                                                                                                                                                   used to increase resistance to enteric pathogens and
                                                                                                                                                                                                                                                                                       activity, including
                                                                                                                                                                                                                           Immune system modulation and treatment of autoimmune disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2002-241760/29.
DB; AAD31886.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VIALACTIA BIOSCIENCE NZ LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     flavour; aroma; texture;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2000US-0634238
2000US-0724623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  process; anti-infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2001WO-NZ00160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         257pp; English
                                                                                                                                                                                                                                                                                     treatment of rotavirus infection and infantile
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bloksberg LN, Lid R, O'toole PW,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           dehydrogenase butA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nutritional; dairy manufacture; tion; rotavirus infection; heart
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lubbers
W, Reid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ä¥
                                                                                                                                                                                                                                                                                                         anti-infection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dekker J;
Coolbear T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ture; therapy;
                                                                                                                                                                                                           of blood
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AARO4044
ID AAR
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      Query Match
Best Local S
Matches 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 12
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                                                                              DNA encoding glucose dehydrogenase (GDH) derived from B. megaterium encodes the amino acid sequence below. The DNA may be integrated into a vector for replication in E. coli. A large amt. of GDH may be produced at low cost. The GDH is used in clinical laboratory tests in the food industry in enzymic assays for glucose
                                                    Sequence
                                                                                                                                                          Claim 1; ; 12pp; Japanese.
                                                                                                                                                                               Glucose dehydrogenase prodn. from Bacillus megaterium culturing recombinant DNA-contg. transformants in nutr culture medium, used in food industry
                                                                                                                                                                                                                                                                                   06-SEP-1988;
                                                                                                                                                                                                                                                                                                          06-SEP-1988;
                                                                                                                                                                                                                                                                                                                                                          JP02072878-A
                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GDH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAR04044 standard; protein; 261
                                                                                                                                                                                                                                                         (AMAN ) AMANO PHARM
                                                                                                                                                                                                                                                                                                                                                                                                                                          Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAR04044;
                                                                                                                                                                                                                                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacillus megaterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Glucose dehydrogenase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02-MAR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           179 RGIRVNAIGPGAIETP-INAEKFADKAQYDQTVAMIPQGRLGKPEDVAAGAAWLASTESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
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                                                                                                                                                                                                                                    1990-121044/16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vector; E. coli; enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YVTGTTLFIDGGMT 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FATGSEFVVDGGYT 250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FLGARAALNYFLDHHQPGNIINISSVHEQIPWPTFASYAAAKGSVKLFTETIAMEYA--N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YDVRVNTVHPGYIKTPLVDDLPGAEEAMSQRT---KTPMGHIGEPNDIAYICVYLASNESK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MYRDLNGKVAVVTGGSKGIGAGIAERFGQEHMAVVINYLGDHEGARKTADTVIKNGGQAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIHADVSTEAGIASLVKTAESEFGRLDVWVNNAGMEIKAPTHEVSLDDWNKVIAINQTGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGV
    28.3%; l Similarity 33.3%; 85; Conservative
                                                    261 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                  88JP-0223343.
                                                                                                                                                                                                                                                                                                          88JP-0223343
                                                                                                                                                                                                                                                                                                                                                                                             95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                               /label- LEU,
                                                                                                                                                                                                                                                                                                                                                                                                       /label- ALA,
                                                                                                                                                                                                                                                                                                                                                                                                                              label- ASP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     label- SER,
    49;
 Score 364.5; DB 11;
Pred. No. 4.1e-27;
9; Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                 MET
                                                                                                                                                                                                                                                                                                                                                                                                                              GLU
                                                                                                                                                                                                                                                                                                                                                                                                       SER
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          assay;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          food
                                                                                                                                                                                            nutrient
 Indels
                       Length
                                                                                                                                                                                                      by
                          261;
 9;
Gaps
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                                                      22-SEP-1988;
                                                                            22-SEP-1989;
                                                                                                                                                                                               Misc-difference
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                              (AMAN ) AMANO PHARM
                                                                                                     19-MAY-1992
                                                                                                                          US5114853-A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLD 116
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                                                     88JP-0237699
                                                                            89US-0410844
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                                                                                                                                            "together with residues 96,252 may be replaced by a thermostability-conferring amino acid provided that taken together they are not Glu, Gln, and Tyr respective
                                                                                                                                                                                                                                                               "together with residues 252,253 may be replaced by a thermostability-conferring amino acid provided that taken together they are not Glu, Gln, and Tyr respectively"
                                                                                                                                                                                                     "together with residues 96,253 may be replaced by a thermostability-conferring amino acid provided that taken together they are not Glu, Gln, and Tyr respective
                                                                                                                                                                                                                                                                                                                                                                          Asp,
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Makino Y,

Negoro S,

Okada H,

Urabe

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RESULT 14
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Best Local S
Matches 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A DNA library was prepared in E. coli C600, and screened with probe AAQ29704, resulting in 3 positive colonies. These were cultured, and plasmid DNA prepared from them and cut with EcoRI and Sall. The probe AAQ29704 was then used to probe a PAGE gel and found to strongly hybridise with a 3.6kb fragment. The 3 colonies were all thus found to have the same plasmid, and this was named pCDA1 pCDA1 was cut with EcoRI and SauJAI, and a 930bp fragment produced and sequenced, and was found to encode the sequence given. pCAA1 was then cut with EcoRI and PvuII and a 1.5kb fragment isolated. This was then cloned into expression vector pKX223-3 and transformed into
                                        21-MAR-2000;
23-MAY-2000;
                                                                                                                                              WO200170955-A2
                                                                                                                                                                                                   Antisense; prokaryotic cellular proliferation protein; antibiotic; antibacterial; drug design.
                                                                                                                                                                                                                                              Staphylococcus aureus cellular proliferation protein #469
                                                                                                                                                                                                                                                                                                                                       AAU34193 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           used
                         26-MAY-2000;
                                                                                 21-MAR-2001; 2001WO-US09180.
                                                                                                                                                                          Staphylococcus aureus
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      glutamine 96 replaced by alanine
                                                                                                                                                                                                                                                                                14-FEB-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                    237 SYVTGITLFADGGMT 251
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d to express heat stable protein in Esherichia coli, e.g. with
                                                                                                                                                                                                                                                                                                                                                                                                                                                 KFATGSEFVVDGGYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KDYDVRVNTVHPGYIKTPL-VDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNES 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AIAVKGDVTVESDVINLVQSXIKEFGKLDVMINNAGXENPVSSHEMSLSDWNKVIDTNLT 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLD 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MYKDLEGKVVVITGSSTGLGKXMAIRFATEKAKVVVNYRSKEXEANSVLEEIKKVG--GE 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAA-----KSVGTPDQ 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          K--GIRVNNIGPGAINTPINAEKFADPQERADVESMIPMGYIGEPEEIAAVAAWLASSEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAFLGSREAIKYFVENDIKGTVINNSSVHEKIPWPLFVHYAASKGGMKLMTETLALEYAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 261 AA;
         2000US-206848P.
2000US-207727P.
2000US-242578P.
                                                                                                                                                                                                                                                                             (first entry)
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                                                      2000US-191078P
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Sequence

.251 AA;

Length 251;

6.

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to identify proteins used in proliferation, to express these proteins, and to obtain antibodies capable of binding to the expressed proteins. The proteins can be used to screen compounds in rational drug discovery programmes. The antisense nucleic acid sequence is also useful to screen for homologous nucleic acids which are required for cell proliferation in a wide variety of organisms. The present sequence represents an essential prokaryotic cellular proliferation protein.

Note: The sequence data for this patent did not form part
                                                                                                              of the printed specification, but was obtained in electronic format directly from WIPO at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                genes, their use in the discovery of novel antibiotics, the essential genes themselves and the encoded proteins. The prokaryotes used are Escherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella pneumoniae, Pseudomonas aeruginosa and Enterococcus faecalis. The invention is also useful for the identification of potential new targets for antibiotic development. The antisense nucleic acids can also be used to identify the control of the interest of the control of the cont
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16-FEB-2001; 2001US-269308P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The invention relates to antisense inhibitors of genes essential prokaryotic cellular proliferation, their use in identifying the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Haselbeck R,
Yamamoto RT,
                                                                  ftp.wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Example 3; Seq ID No 5689; 511pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            New polynucleotides for the identification and antibiotics, comprise sequences of antisense nu
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Xu HH;
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Best Local Similarity
236 SFITGETIRIDGGVMA 251
                                                                                            183 VNTVHPGYIKTPLVDDLPGAEE-----AMSQRTKTPMGHIGEPNDIAYICVYLASNES 235
                               236 KFATGSEFVVDGGYTA 251
                                                                                                                            120 KMMLPLMMTK--GGSIVNTSSFSGQAADLYRSGYNAAKGAVINFTKSIAIEYG-RD-GIR
                                                                                                                                                                  123
                                                                                                                                                                                            61 ASEQQIDNFASEIREQFGHVDVLFNNAGVDNAAGR-IHEYPTDVYDKIMNVDMRGTFLMT
                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                             1 LENKVAVVTGASTGIGQASAIALAQEGAYVLAVDIAEAVSETVDKIKSNGDKAKAYVVDI 60
                                                                                                                                                                                                                                                                             RLGIQRMKNKGLGASIINMSSIEGFYGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVR 182
                                                             ANAIAPGTIETPLVDKLTGTSEDKEGKAFRENQKWMTPLGRLGKPEEVGKLVVFLASDES
                                                                                                                                                                                                                            SDEDGWTKLFDATEKAFGPVSTLVNNAGI -- AVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
                                                                                                                                                                                                                                                                                                                                      91;
                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                               28.2%; Score 364; DB 22; 35.5%; Pred. No. 4.3e-27; Live 42; Mismatches 109
                                                                                                                                                                                                                                                                                                                                   109;
                                                                                                                                                                                                                                                                                                                                   Indels
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XEXTXXXX

26-JAN-2001 AAB10740;

(first entry)

B. megaterium glucose dehydrogenase GlcDH protein.

AAB10740 RESULT 15

AAB10740 standard; Protein;

272

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Search completed: April 22, 2003, 17:15:27 Job time : 39 secs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 82; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           recombinant protein/polypeptide in a recombinant production method. The host cell is also useful for recombinant production of the protein/polypeptide. The fusion proteins containing glucose dehydrogenase can be quickly detected in SDS-PAGE gels. This sequence represents the Bacillus megaterium glucose dehydrogenase GlobH which is used in the construction of fusion proteins as described in the method of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein (in a detection system) for any type of recombinant protein/polypeptide in a fusion protein. Glucose dehydrogenase can be used to detect protein-protein interactions, where it corresponds to a partner of a recombinant protein/polypeptide. Expression vectors encoding the fusion proteins are useful to optimize the expression of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This invention describes a novel recombinant fusion protein (A) comprising at least a first and a second amino acid sequence, characterized in that the first sequence has the biological activity of a glucose dehydrogenase. Glucose dehydrogenase is useful as a detector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Glucose dehydrogenase fusion proteins, useful in expression systems quick detection of foreign proteins by gel electrophoresis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 2000-558290/51.
N-PSDB; AAA97948.
                                                                                                                    232 ASSQASYVTGITLFADGGMT 251
                                                                                                                                                                                                                                        174 LEYAPK--GIRVNNIGPGAMNTPINAEKFADPEQRADVESMIPMGYIGKPEEVAAVAAFL 231
                                                                                                                                                                                                                                                                         172 LDCALKDYDVRVNTVHPGYIKTPL-VDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYL 230
                                                                                                                                                                                                                                                                                                                                                                   114 DTNLTGAFLGSREAIKYFVENDIKGNVINMSSVHEMIPWPLFVHYAASKGGMKLMTETLA 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       invention
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MOLECULE TYPE: protein

SEQUENCE DESCRIPTION: SEQ ID

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Best Local Similarity
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Patent No. 6225099
GENERAL INFORMATION:
APPLICANT: Hummel, Werner, Riebel, Bettina
TITLE OF INVENTION: Alcohol dehydrogenase and its use for
enzymatic production of chiral hydroxy compounds
                                                                                                                                                                                                                                                                                                                      TELEPHONE: (212) 688-9200
TELEFAX: (212) 838-3884
INFORMATION FOR SEQ ID NO: 8:
                    61 QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
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                                                                               1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQİQFF 60
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                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: 08/822,322
FILING DATE: <Unknown>
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                    NAME: Hanson, No. 6225099man D.
REGISTRATION NUMBER: 30,946
REFERENCE/DOCKET NUMBER: BOER 1076
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM
OPERATING SYSTEM: PC-DOS
SOETWARE: Wordperfect
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.5 inch,
                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
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MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITGRHSDVGEKAAKSVGTPDQIQFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
ADDRESSEE: Felfe & Lynch
STREET: 805 Third Avenue
CITY: New York City
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEFVVDGGYTAQ 252
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                                                                                                                                                                                                                                                                     TYPE: amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US/09/466,109 FILING DATE: 17-Dec-1999
                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10022
                                                                                                                                                     99.0%;
                                                                                                                                         0
                                                                                                                                  Score 1277; DB 4;
Pred. No. 5.7e-129;
0; Mismatches 2;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360 kb storage
                                                                                                                                                                   Length 252;
                                                                                                                               Gaps
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US-08-822-322-9
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Best Local Similarity
Matches 202; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPHONE: (212) 688-9200
TELEFAX: (212) 838-3884
INFORMATION FOR SEQ ID NO: 9:
SEQUENCE CHARACTERISTICS:
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APPLICANT: Hummel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: Wordperfect
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/822,322
FILING DATE: 21-March-1997
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY: 11
MOLECULE TYPE:
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ATTORNEY/AGENT INFORMATION
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MEDIUM TYPE: Diskett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Hummel, Werner, Riebel, Bettina TITLE OF INVENTION: Alcohol dehydrogenase of TITLE OF INVENTION: enzymatic production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the production of the pr
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                                    122 TRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDV 181
                                                                                                                           61 XXXXXXXXXXLFDATEEAFGPVTTVVNNAGIAVNKSVEDTTTEEWRKLLSVNLDGVFFG
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TRLGIQAMKXXGLGASIINMSSIEGFVGDPTLGAYNASKGAVRIMSKSAALDCALKDYDV
                                                                                                                                                            HDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFG 121
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    Application US/08822322
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                                                                                                                                                                                                                                                                                                                                                                                                                          79.0%;
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                                                                                                                                                                                                                                                                                                                                                                                     Score 1019; DB 3;
Pred. No. 2.8e-101;
4; Mismatches 35;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 251;
   180
                                                                                                                                  120
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US-09-466-109-9
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Patent No. 6225099
GENERAL INFORMATION:
APPLICANT: Hummel, Werner, Riebel, Bettina
TITLE OF INVENTION: Alcohol dehydrogenase and its use for
                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO: 9: SEQUENCE CHARACTERISTICS:
   181
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                                                                                                                             61 XXXXXXXXXXLFDATEEAFGPVTTVVNNAGIAVNKSVEDTTTEEWRKLLSVNLDGVFFG 120
                                                                                                                                                                                                                                                             Local Similarity
nes 202; Conserv
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                                                                                                                                                                                                                                                                                                                                      TOPOLOGY: linear
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 9
CORRESPONDENCE ADDRESS:
ADDRESSEE: Felfe & Lynch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 688-9200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
NAME: Hanson, No. 6225099man D.
REGISTRATION NUMBER: 30,946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION DATA:
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                                                           PRIOR
                RVNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATGS 241
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RVNTVHPGYIKTPLVDDLEGAEEMMSQRTKTPMGHIGEPNDIAYICVYLASDETKFATGA
                                                                                                                                                           HDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFG 121
                                                                                                                                                                                         EFVVDGGYTAQ 252
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                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 251 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: 08/822,322 FILING DATE: <Unknown>
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                                                                                                                                                                                                                                                                                                                                                                                        TYPE: amino acid
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                                                                                                                                                                                                                                                             Conservative
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                                                                                                                                                                                                                                                                         79.0%; Score 1019; DB 4; 80.5%; Pred. No. 2.8e-101;
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                                                                                                                                                                                                                                                                                          Length 251;
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240
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Query Match
Best Local Similarity
Watches 97; Conserv
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US-08-815-225-4
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INFORMATION FOR SEQ ID NO: '
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SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
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TELECOMMUNICATION INFORMATION:
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236
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                                  242 EFVVDGGYT 250
                                                                                                     183 VNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIG-EPNDIAYICVYLASNESKFATGS 241
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                                                                                                                                                                                                                  60 DVTIEEDWQRVVAYAREEFGSVDGLVNNAGISTGMFLETESVERFRKVVDINLTGVFIGM 119
                                                                                                                                                                                                                                                       63 DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
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ELAVDGGWT 244
                                                                                                                                             KTVIPAMKDAG-GGSIVNISSAAGLMGLALTSSYGASKWGVRGLSKLAAVE--LGTDRIR 176
                                                                     VNSVHPGMTYTPMTAE-TGTRQGEGNYPNTPMGRVGNEPGETAGAVVKLLSDTSSYVTGA
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1185 Avenue of the Americas
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TYPE: PRT
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US-09-504-358-14
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                                                        Matches
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                                                                                                                                                                                                                                                     TITLE OF INVENTION: GENES AND ENZYMES FOR THE PRODUCTION OF ADIPIC ACID INTERMEDIATES FILE REFERENCE: BC1001 US NA CURRENT APPLICATION NUMBER: US/09/954,314 CURRENT FILING DATE: 2001-09-17
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Best Local Similarity
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SOFTWARE: Microsoft Office
SEQ ID NO 14
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APPLICANT: Brzostowicz, Patricia C.
                                                                                                                                                                                                              NUMBER OF SEQ ID NOS:
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CURRENT FILING DATE: 2000-02-15
EARLIER APPLICATION NUMBER: 60/120,702
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APPLICANT: BIZOSTOWICE, PARTICIA C.
TITLE OF INVENTION: GENES AND ENZYMES FOR THE PRODUCTION OF ADIPIC ACID INTERMEDIATES
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US-09-468-738A-29
; Sequence 29, Application US/09468738A
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APPLICANT: Kimoto, No. 6312933ihiro APPLICANT: Yamamoto, Hiroaki
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US-09-134-001C-3562
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; Sequence 3562, Application US/09134001C

; Patent No. 6380370
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PRIOR FILING DATE: 1997-08-14
NUMBER OF SEQ ID NOS: 5674
SEQ ID NO 3562
LENGTH: 257
TYPE: PRT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 376; DB 4; 1
Pred. No. 2.8e-32;
9; Mismatches 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
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Yamamoto, Hiroaki

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; ORGANISM: Bacillus subtilis US-09-940-019-29
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US-09-940-019-29
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                                                                                                           SEQ ID NO 29.
LENGTH: 261
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 29, Application US/09940019 Patent No. 6416986
                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
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Best Local
     Best Local Similarity 33. Matches 87; Conservative
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                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/940,019
CURRENT FILING DATE: 2001-08-27
PRIOR APPLICATION NUMBER: 09/468,738
PRIOR FILING DATE: 1999-06-17
PRIOR APPLICATION NUMBER: JP 1998-363130
PRIOR FILING DATE: 1998-12-21
NUMBER OF SEQ ID NOS: 29
                                                                                                                                                                                                                                                                                           APPLICANT: Yamamoto, Hiroaki
APPLICANT: Mitsuhashi, Kazuya
TITLE OF INVENTION: NOVEL CARBONYL REDUCTASE, METHOD FOR PRODUCING SAID ENZYME, DNA
TITLE OF INVENTION: ENCODING SAID ENZYME, AND METHOD FOR PRODUCING ALCOHOL USING SA
TITLE OF INVENTION: ENZYME
FILE REFERENCE: 06501-050001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION NUMBER: JP 1999-171160
PRIOR FILING DATE: 1999-06-17
PRIOR APPLICATION NUMBER: JP 1998-363130
PRIOR FILING DATE: 1998-12-21
                                                                                                                                                               SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/09/468,738A CURRENT FILING DATE: 1999-12-21
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TITLE OF INVENTION: NOVEL CARBONYL REDUCTASE, METHOD FOR PRODUCING SAID ENZYME, DNA
TITLE OF INVENTION: ENCODING SAID ENZYME, AND METHOD FOR PRODUCING ALCOHOL USING SI
TITLE OF INVENTION: ENZYME
FILE REFERENCE: 06501-050001
                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Kimoto, No: 64169861hiro
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180 DVRVNTVHPGYIKTPLVDDLPGAEEAMSQRTKT-----PMGHIGEPNDIAYICVYLASN 233
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62 VQGDVTKEEDVKNIVQTAIKEFGTLDIMINNAGLENPVPSHEMPLKDWDKVIGTNLTGAF 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60 FQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVF 119
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nes 87; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EASYVTGITLFADGGMT 251
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                                                                                                                             261
                                                                                                                                                              PatentIn Ver.
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                   27.8%;
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                                                                                                                                                          2.0, reformatted using
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   Score 358.5; DB 4
Pred. No. 2.2e-30;
5; Mismatches 104
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                                    DB 4;
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RESULT 12
US-09-134-001C-4431
; Sequence 4431, Application US/09134001C
; Patent No. 6380370
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RESULT 11
US-09-134-001C-4512
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PRIOR FILING DATE: 1997-11-08
PRIOR APPLICATION NUMBER: US 60/055,779
PRIOR FILING DATE: 1997-08-14
NUMBER OF SEQ ID NOS: 5674
SEQ ID NO 4512
LENGTH: 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Lynn Doucette-Stamm et al
TITLE OF INVENTION: EPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILE REFERENCE: GTC-007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: PRT
                                                                                                                                                                                                         127 QRMKNKGLGASIINMSSIEGFVGDPSLGAVNASKGAVRIMSKSAALDCALKDYDVRVNTV 186
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                                                                                                                                      187
                                                                                                                                                                                   130
                                          234 ESKFATGSEFVVDGG 248
                                                                                     188 APGIVETPM----MKGIAEKLAEENNQPMEWGWKQFTDQIALKRLSKPEDVANVVSFLAGS 244
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DSDYITGQTIIVDGG
                                                                                                                                                                                   EQFDKLGHGGKIINATSQAGVEGNAGLSLYSSTKFAVRGLTQVAARDLAEK--NITVNAF 187
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                                                                                                                                      GHIGEPNDIAYICVYLASN
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                                                                                                                                                                                                                                                                                                             NUMBER OF SEQ ID NOS: 49
SOFTWARE: Microsoft Office 97
SEQ ID NO 12
                                                                                                                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                             ORGANISM: Brevibacterium sp HCU
-09-504-358-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 12,
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Best Local Similarity
Matches 88; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Patent No. 6365376
                                                                                                                                                                                                                                                                                                                                                                      EARLIER APPLICATION NUMBER: 60/120,702
EARLIER FILING DATE: 1999-February-19
                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION NUMBER: US/09/504,358
CURRENT FILING DATE: 2000-02-15
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SEQ ID NO 4431
LENGTH: 274
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM: Staphylococcus epidermidis 09-134-001C-4431
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                                                                                                                                                                                                                                                                         TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION: GENES AND ENZYMES FOR THE PRODUCTION OF ADIPIC THE REFERENCE: BC1001 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION NUMBER: US 60/064,964
PRIOR FILING DATE: 1997-11-08
PRIOR APPLICATION NUMBER: US 60/055,779
PRIOR FILING DATE: 1997-08-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Lynn Doucette-Stamm et al TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS TITLE OF INVENTION: EPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPLICANT: Rouviere, Pierre E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION NUMBER: US/09/134,001C CURRENT FILING DATE: 1998-08-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILE REFERENCE: GTC-007
                                                                                                                                                                                                                                                                                         ENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182 RVNTVHPGYIKTPLVDDLPGA--EEA-----MSQRTKTPMGHIGEPNDIAYICVYLASNE 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122 TRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDV 181
               59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64 DISDDKQVKQFSEKIAQEFGHVDVIFNNAGVDNGAGRIHEYPVEVFDKIMAVDMRGTFLV 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4 RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVG-TPDQIQFFQH 62
                                                                                    MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSV--GTPDQIQ 58
                                            VTDSLGGDVFLVTGGAGGIGKATTTALAERGGRVVLTDVDEDAGSQVADEVRRNTNGEIR 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RANAIAPGTIETPLVDNLAGTSDEEAGQTFRENQKWVTPLGRLGTPDEVGKLVAFLASDD 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SSFITGETIRIDGGVMA 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TKPLLPLMMKQ--GGSIINTASFSGQAADLYRSGYNAAKGGVINFTKSIAIEYGRE-•NI 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKS-VEETTTAEWRKLLAVNLDGVFFG 12:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKFATGSEFVVDGGYTA 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RLENKIAVITGASTGIGQASAVALAIEGAHVLALD-ISDQLEETVQSINDNGGKATAYRV 63
                                                                                                                                                                                                                                                                                         258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Application US/09504358
                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                25.6%; Score 330.5; DB 4; 33.7%; Pred. No. 2.2e-27; Mismatches 97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             26.4%; Score 341; DB 4; 34.2%; Pred. No. 1.8e-28;
--DEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAE 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 274
                                                                                                                                                                          Length 258;
                                                                                                                                  Indels
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                                                                                                                                  33;
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US-08-440-856A-4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Brevibacterium sp HCU US-09-954-314-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 14
US-09-954-314-12
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                                                                                                               Sequence 4, Application US/08440856A Patent No. 5750873
GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE: Microsoft Office
SEQ ID NO 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 12, Application US/09954314 Patent No: 6465224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/954
CURRENT FILING DATE: 2001-09-17
PRIOR APPLICATION NUMBER: 60/120,702
PRIOR FILING DATE: 1999-February-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 25
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: GENES AND ENZYMES FILE REFERENCE: BC1001 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Rouviere, Pierre E.
                                                          TITLE OF INVENTION:
                                         NUMBER OF SEQUENCES:
                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                       229
                                                                                                                                                                                                                                                                                                                    171 HLVGLLGVEWA--KTGVRVNAVAPGYTRTPILEALKAESPETISEWTERIPNGRLNDPSE 228
                                                                                                                                                                                                                                                                                                                                                                                             112 WLRTVDINLNGVFWCCREFGKRMIARGRG-SVVTTSSIAGFRTVSPERHAAYGATKAAVA 170
                                                                                                                                                                                                                                                                                                                                                                                                                                  107 WRKLLAVNLDGVFFGTRLGIQRMKNKGLGASIINMSSIEGF--VGDPSLGAYNASKGAVR 164
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity hes 91; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSV--GTPDQIQ 58
                                                                                                                                                                                                                                                                                                                                                         IMSKSAALDCALKDYDVRVNTVHPGYIKTPLVDDLPG-AEEAMSQRT-KTPMGHIGEPND 222
                                                                                                                                                                                                                                                 IADGVVFLMSNAARGITGTVLHIDGGYAAR
                                                                                                                                                                                                                                                                                     IAYICVYLASNESKFATGSEFVVDGGYTAQ 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEPLDVTNPAAVTECAQKLDDEGW--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FFQHDSS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTDSLGGDVFLVTGGAGGIGKATTTALAERGGRVVLTDVDEDAGSQVADEVRRNTNGEIR 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WLRTVDINLNGVFWCCREFGKRMIARGRG-SVVTTSSIAGFRTVSPERHAAYGATKAAVA 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IAYICVYLASNESKFATGSEFVVDGGYTAQ 252
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IADGVVFLMSNAARGITGTVLHIDGGYAAR 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEPLDVTNPAAVTECACKLDDEGW--
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                                                                        DELLAPORTA, STEPHEN L.
VENTION: MATERIALS AND METHODS FOR PRODUCING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
MORRISON & FOERSTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25.6%;
33.7%;
                                                        PLANTS WITH SINGLE-SEX FLOWERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --DEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAE 106
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 330.5;
Pred. No. 2.
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                                                                                                                                                                                                                                                   258
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----PVYGLMANAGIAPSSSAVDYSDEL 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----PVYGLMANAGIAPSSSAVDYSDEL 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    . 2e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   97;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
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ADDRESSEE

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US-08-440-856A-4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET: 2000 PENNSYLVANIA AVE. N.W.
CITY: WASHINGTON
STATE: D.C.
COUNTRY: USA
ZIP: 20037
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION DATA:
INCIDENTALES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELLER: 706141
TELLEX: 706141
NFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
SEQUENCE CHARACTERISTICS:
1-ENGTH: 333 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX: (202) 887-1517
TELEFAX: (202) 887-0763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
                                            208 QRTKTPMGHIGEPNDIAYICVYLASNESKFATGSEFVVDGGYT 250
                                                                                                                                                                                                                                                                                                   106 RCDVSVEEDVERAVERAVARYGRLDVLCNNAGVLGRQTRAAKSILSFDAGEFDRVLRVNA 165
283 RGLATLKGATLRPRDIAEAALFLASDDSRYISGHNLVVDGGVT 325
                                                                                                 223 LGAHGIRVNCISPFGVATPMLINAWRQGHDASTADDADADIDLDIAVPSDQEVEKMEEVV 282
                                                                                                                                                     176 LKDYDVRVNTVHPGYIKTPLV-----
                                                                                                                                                                                                       166 LGAALGMKHAALAMTQRRAG-SIISVASVAGVLGGLGPHAYTASKHAIVGLTKNAA--CE 222
                                                                                                                                                                                                                                                   116 DGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCA 175
                                                                                                                                                                                                                                                                                                                                                  61 QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGI-----AVNKSVEETTTAEWRKLLAVNL 115
                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: US/0 FILING DATE: 15-MAY-1995 CLASSIFICATION: 800
                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF 60
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MILLMAN, ROBERT A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           single
linear
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Search completed: April 22, 2003, 17:17:18 Job time : 20 secs

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Result
No.
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Maximum DB
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                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have score greater than or equal to the score of the result being pu and is derived by analysis of the total score distribution.
                                                                                                                                                                          364
358.5
                                                                                                                                                                                                         366.
                                                                                                                                                                                                                                                                                                                   Score
                                                                                                                                                                                                                                         395.5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   length: 0
length: 2000000000
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1290
1 MSNRLDGKVAIITGGTLGIG......NESKFATGSEFVVDGGYTAQ 252
                                                                                                                                                                                                                                                                                                                 Query
Match Length DB
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BLOSUM62
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      Published_Applications_AA: *
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Listing first 45 summaries
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /cgn2_6/ptodata/1/pubpaa/PCTUS_PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US08_PUBCOMB.pep:*
/cgn2_6/ptodata/1/pubpaa/US09_NEW_PUB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/PCT_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US06_PUBCOMB.pep:*
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/cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US60_NEW_PUB.pep:*
/cgn2_6/ptodata/1/pubpaa/US60_PUBCOMB.pep:*
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US-09-978-192A-468
US-09-978-192A-468
US-09-999-832A-468
US-09-978-189-468
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US-09-978-191A-468
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US-09-931-186-17
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US-09-954-314-14
US-09-815-242-12688
                                                                                                                                                                          US-09-815-242-5689
US-09-940-037A-29
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Sequence 15, Appl
Sequence 14, Appl
Sequence 74, Appl
Sequence 5689, Ap
Sequence 29, Appl
Sequence 17, Appl
Sequence 17, Appl
Sequence 468, App
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| 299 294 | 299.5 | 301.5 | 302 | 305 | 306 | 311.5 | 317 | 321.5 | 324 | 330.5 | 336.5 | 336.5 | 340 | .340 | 340 | . 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 |
| 23.2 22.8 | 23.2 | | _ | | | | | | | 25.6 | 26.1 | 26.1 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 |
| 242 246 | 258 | 276 | 262 | 262 | 245 | 253 | 258 | 251 | 274 | 258 | 272 | 271 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 | 270 |
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| US-09-815-242-10974 US-09-815-242-5461 | US-09-738-626-6436 | US-09-944-160-24 | US-09-802-853-6 | US-09-815-242-10597 | US-09-815-242-10921 | US-09-815-242-11842 | US-10-156-055A-1 | US-09-922-501-16 | US-09-976-059-17 | US-09-954-314-12 | US-09-815-242-13679 | US-09-815-242-13387 | US-10-016-177A-468 | US-10-013-929A-468 | US-09-978-193A-468 | US-10-013-921A-468 | US-09-978-423A-468 | US-09-918-585A-468 | US-10-167-749-468 | US-09-999-833A-468 | US-09-981-915A-468 | US-09-978-824-468 | US-10-017-081A-468 | US-09-978-585A-468 |
| e 1097 e 5461 | Sequence 6436, Ap | Sequence 24, Appl | | Sequence 10597, A | Sequence 10921, A | Sequence 11842, A | Sequence 1, Appl1 | | Sequence 17, Appl | Sequence 12, Appl | Sequence 13679, A | | 468, | 468, | • | Sequence 468, App | Sequence 468, App | • | Sequence 468, App | Sequence 468, App | • | • | Sequence 468, App | Sequence 468, App |

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                                                                                                                                                                                                                                                                                                                         ; TYPE: PRT ; ORGANISM: Lactobacillus brevis US-09-910-033A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-910-033A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 2, Application US/09910033A Publication No. US20030054520A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQ ID NOS: 7
SOFTWARE: Patentin version 3.1
SEQ ID NO 2
LENGTH: 252
                                                                                                                                                                                                                                                            Best Local Similarity Matches 252; Conserv
                                                                                                                                                                                                                                                                                           Query Match .
                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/09/910,033A CURRENT FILING DATE: 2001-07-23 PRIOR APPLICATION NUMBER: DE 10037101.9 PRIOR FILING DATE: 2000-07-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: RIEBEL, Bettina APPLICANT: HUMMEL, Werner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILE REFERENCE: 210212US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: BOMMARIUS, Andreas
TITLE OF INVENTION: RECOMBINANT ENZYMES HAVING IMPROVED NAD(H) ACCEPTANCE
61
                                                                                                                                             61 QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                             1 MSNRLDGKVAIITGGTLGIGLAIATKEVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF
                                                                                                                                                                                            MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF
                                                                                                                              QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF
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Conservative 0
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                                                                                                                                                                                                                                                                                        Length 252;
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241 SEFVVDGGYTAQ 252

SEFVVDGGYTAQ

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RESULT 3
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Best Local Similarity
Matches 101; Conserv
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LENCTH: 254
TYPE: PRT
ORGANISM: Pichia finlandica
>-09-978-758-2
                                                                                                                        APPLICANT:
APPLICANT:
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                                                                                      (PPLICANT:
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PRIOR FILING DATE: 2000-02-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR FILING DATE: 2001-02-15
PRIOR APPLICATION NUMBER: JP 2000-374593
PRIOR FILING DATE: 2000-12-08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION NUMBER: US/09/978,758
CURRENT FILING DATE: 2002-04-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: (R)-2-OCTANOL DEHYDROGENASES, METHODS TITLE OF INVENTION: FOR PRODUCING THE ENZYMES, DNA ENCOD TITLE OF INVENTION: METHODS FOR PRODUCING ALCOHOLS USING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: PCT/JP01/01082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Kudoh, Masatake
APPLICANT: Yamamoto, Hiro
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          equence 2, Application US/09978758 iblication No. US20020192783A1
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                                                                                                                                                                                                                                                                                                                                                                                                                              175 ALKDYDVRVNTVHPGYIKTPLVDDLPGAEEAMSQRTKT-PMGHIGEPNDIAVICVYLASN 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    115 LDGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDC 174
                                                                                                                                                                                                                                                                                                                                    236 EATFINGVSLPVDGGYTAQ 254
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  55 DQIQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVN 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MSYNFHNKVAVVTGALSGIGLSVAKKFLQLGAKVTISDVSGEKKYHETVVALKAQNLNT- 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITD-----RHSDVGEKAAKSVGTP 54
                                                                                                                                                                                                                                                                                                                                                                                                      A--SHGIRVNSVNPGYISTPLIDEVP--KERLDKLVSLHPIGRLGRPEEVADAVAFLCSQ 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LNGVFLLDKLAINYWLEKSKPGVIVNNGSVHSFVAAPGLAHYGAAKGGVKLLTQTLALEY 179
                                                                                                                                                                                                  INFORMATION:
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                                                                                                                                                                                                                    5, Application US/09931186
US20020132319A1
                                                                                                                                                                            ABREO, MELWYN A
PELLETIER, LAURA A.
REJTO, PAUL A.
SHOWALTER, RICHARD E.
TEMPCZYK-RUSSELL, ANNA
                                                                                                  MARGOSIAK, STEVE
                                                                                                                                                          AGREE, CHARLES S.
                                                                                MENG, JERRY J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Yamamoto, Hiroaki
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Pred. No. 1.1e-34;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALCOHOLS USING THE ENZYMES
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62 HDSSDEDGWTKLFDATEKAFGPVSTLVNNAGI-AVNKSVEETTTAEWRKLLAVNLDGVFF 120

LDVSDESEVETVVSDIAKRFGAINVLVNNAGVTGADKPTHEIDERDLDLVLSVDVKGVFF

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US-09-954-314-14
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                                                              Query Match
Best Local Similarity 37.7
                                                                                                                                                                                                                                   SOFTWARE: Microsoft Office 97 SEQ ID NO 14
                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 14, Application UPatent No. US20020127666A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/09/931,186
CURRENT FILING DATE: 2001-08-17
NUMBER OF SEQ ID NOS: 24
SOFTWARE: PATENTIN Ver. 2.1
SEQ ID NO 15
LENCTH: 253
TYPE: PRT
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Best Local :
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                                                                                                                                                                                                                                                                          NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: 60/120,702 PRIOR FILING DATE: 1999-February-19
                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/
CURRENT FILING DATE: 2001-09-1
                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: GENES AND ENZYMES FILE REFERENCE: BC1001 US NA
                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Rouviere, Pierre E. APPLICANT: Brzostowicz, Patri
                                                                                                                                                                                               TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: VILLAFRANCA, J. ERNEST
TITLE OF INVENTION: PEPTIDE MUTANT OF HUMAN ERAB/HADH2, ]
TITLE OF INVENTION: STRUCTURE, AND MATERIALS AND METHOD
TITLE OF INVENTION: OF INHIBITORS THEREOF
FILE REFERENCE: 0125-0049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                   LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               235 LAVDGGWT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 243 FVVDGGYT 250
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 183 VNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATGSE 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      119 KTVIPAMKDAG-GGSIVNISSAAGLMGLALTSSYGASKWGVRGLSKLAAVE--LGTDRIR 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123 RLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVR 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59 DVTIEEDWQRVVAYAREEFGSVDGLVNNAGISTGNFLETESVERFRKVVEINLTGVFIGM 118
63
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
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                                                                                                                                                                                                                                                                                    1999-February-19
                                                                                            30.7%; Score 395.5; DB 1
37.7%; Pred. No. 1.5e-29;
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                                                                                                                                                                                                                                                                                                                                                                                                       Patricia C.
                                                                              43;
                                                                                                                                                                                                                                                                                                                                              US/09/954,314
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                                                                                Mismatches
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                                                                                                                 DB 10;
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                                                                          Indels 15;
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US-09-815-242-12688
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                                                                                                                                                                                                                                                                                                                                                                             ; ORGANISM: Staphylococcus aureus US-09-815-242-12688
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQ ID NO 12688
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Best Local Similarity
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Patent No. US20020061569A1
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CURRENT FILING DATE: 2001-03-21
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TITLE OF INVENTION: Identification
TITLE OF INVENTION: prokaryotes
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQ ID NOS: 14110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR FILING DATE: 2001-02-16
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PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
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RANAIAPGTIETPLVDKLTGTSEDKEGKAFRENOKWMTPLGRLGKPEEVGKLVVFLASDE 237
                                                                         TKMMLPLMMTK--GGSIVNTSSFSGQAADLYRSGYNAAKGAVINFTKSIAIEYG-RD-GI
                                                                                                                                                                                        SSDEDGWTKLFDATEKAFGPVSTLVNNAGI--AVNKSVEETTTAEWRKLLAVNLDGVFFG 121
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                     RVNTVHPGYIKTPLVDDLPGAEE-----AMSQRTKTPMGHIGEPNDIAYICVYLASNE 234
                                                                                                           TRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDV 181
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Zyskind, Judith W.
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Pred. No. 5.1e-27;
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US-09-971-536-74
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                                                  US-09-815-242-5689
                                                                         RESULT 7
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                Sequence 5689, Application US/09815242 Patent No. US20020061569A1
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Best Local Similarity 33.5
Matches 85; Conservative
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SEQ ID NO 74
GENERAL INFORMATION
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PRIOR APPLICATION NUMBER: U.S. No. US20020159976A1 09/634,238
PRIOR FILING DATE: 2000-08-08
PRIOR APPLICATION NUMBER: U.S. No. US20020159976A1 09/724,623
PRIOR APPLICATION NUMBER: U.S. No. US20020159976A1 09/724,623
PRIOR TILING DATE: 2000-11-28
PRIOR APPLICATION NUMBER: PCT/NZ01/00160
PRIOR FILING DATE: 2001-08-08
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CURRENT FILING DATE: 2001-10-02
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APPLICANT: Coolbear, Timothy
TITLE OF INVENTION: Lactobacillus rhamnosus Polynucleotides,
TITLE OF INVENTION: Using Them
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O'Toole, Paul
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Bloksberg, Leonard
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APPLICANT: APPLICANT:

Ohlsen, Kari L. Zyskind, Judith W.

APPLICANT: Haselbeck, Robert

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SEQ. ID NO 5689
LENGTH: 251
TYPE: PRT
                        CURRENT APPLICATION NUMBER: US/09/940,037A
                                                                                                                                                                                                         ENERAL INFORMATION:
                                               TILE OF INVENTION: NOVEL CARBONYL REDUCTASE, METHOD FOR PRODUCING SAID ENZYME, DNA
"ITLE OF INVENTION: ENCODING SAID ENZYME, AND METHOD FOR PRODUCING ALCOHOL USING SAI
"ILE REFERENCE: 06501-050001
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CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
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FILING DATE: 2000-05-26
APPLICATION NUMBER: 60/242,578
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Mitsuhashi, Kazuy
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35.5%; Pred. No. 1.36
Live 42; Mismatches
                                                                                                                                          Kazuya
09/468,738
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1.3e-26;
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                                      SEQ ID NO 1186
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; TYPE: PRT
; ORGANISM: Bacillus subtilis
US-09-940-037A-29
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                                                                            SOFTWARE: FastSEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                               FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
                                                                                                NUMBER OF SEQ ID NOS:
                                                                                                                    PRIOR APPLICATION NUMBER: PRIOR FILING DATE: 2001-02
                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes
TITLE OF INVENTION: Prokaryotes
                                                                                                                                                                                                                                         PRIOR FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION NUMBER: 60/191,078
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ORGANISM: Pseudomonas aeruginosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180 GIRVNNIGPGAINTPI-----NAEKFADPKQKADVESMIPNGYIGEPEEIAAVAAWLASK 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  122 LGSREAIKYFVENDIKGNVINMSSVHEVIPWPLFVHYAASKGGIKLMTETLALEYAPK--
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120 FGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDY 179
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60 FOHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVF 119
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Yamamoto, Robert T.
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Zyskind, Judith W.
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                                                                                                                                                                        60/257,931
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                                                                                                                                                                                                                                                                     : LENGTH: 259
: TYPE: PRT
: ORGANISM: Homo sapiens
US-09-931-186-17
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                                                                                                                                                                                                            Query Match
Best Local Similarity
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                                                                                                                                                                                              Matches
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CURRENT FILING DATE: 2001-08-17
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112 AVNIDGVFFGTRIGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAA 171
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            LICANT: VILLAFRANCA, J. ERNEST
LE OF INVENTION: PEPTIDE MUTANT OF HUMAN ERAB/HADH2,
LE OF INVENTION: STRUCTURE, AND MATERIALS AND METH
LE OF INVENTION: OF INHIBITORS THEREOF
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                                       63 PRGNHAAFQADVSEARAARCLLEQVQACFSRPPSVVVSCAGITQDEFLLHMSEDDWDKVI 122
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                                                                                                                                                     1 MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQ-- 58
                                                                                                                  LONRLRSALALVTGAGSGIGRAVSVRLAGEGATVAACDLDRAAAQETVRLLGGPGSKEGP 62
                                                                            -----FFQHDSSDEDGWTKLFDATEKAFG-PVSTLVNNAGIAVNKSVEETTTAEWRKLL 111
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SHOWALTER, RICHARD E.
TEMPCZYK-RUSSELL, ANNA
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AUST, ROBERT
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PELLETIER, LAURA A.
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                                                                                                                                                                                          26.7%; Score 345; DB 10;
ilarity 32.9%; Pred. No. 8.6e-25;
Conservative 53; Mismatches 106
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35.3%;
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; Pred. No. 2.7e-25;
49; Mismatches 98;
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                                                                                                                                                                                                                                                                                                                                                                                                                URRENT APPLICATION NUMBER: US/09/978,295A
URRENT FILING DATE: 2001-10-15
RIOR APPLICATION NUMBER: 09/918585
RIOR FILING DATE: 2001-07-30
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                               FILING DATE: 1998-03-11
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FILING DATE: 1998-03-12
APPLICATION NUMBER: 60/078004
FILING DATE: 1998-03-13
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FILING DATE: 1998-03-11
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               APPLICATION NUMBER: 60/078886
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Wood, William
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Shelton, David L.
Stewart, Timothy A.
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Filvaroff, Ellen
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Hillan, Kenneth J
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FILING DATE: 1998-04-29
APPLICATION NUMBER: 60/083545
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APPLICATION NUMBER: 60/082804 FILING DATE: 1998-04-22

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1998-04-21

60/082569 60/082568 APPLICATION NUMBER: 60/081952 FILING DATE: 1998-04-15

APPLICATION NUMBER: 60/081838

APPLICATION NUMBER: 60/081817 FILING DATE: 1998-04-15 FILING DATE: 1998-04-09 APPLICATION NUMBER: 60/081955 FILING DATE: 1998-04-15

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Sequence 468, Application US/09978697
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CURRENT APPLICATION NUMBER: US/09/978,697
CURRENT FILING DATE: 2001-10-16
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PRIOR FILING DATE: 2001-07-30
PRIOR APPLICATION NUMBER: 60/062250
PRIOR FILING DATE: 1997-10-17
PRIOR APPLICATION NUMBER: 60/064249
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Stewart, Timothy A.
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Grimaldi, J. Christopher
Gurney, Austin L.
Hillan, Kenneth J
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APPLICATION NUMBER: 60/078939
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APPLICATION NUMBER: 60/078886
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FILING DATE: 1998-04-08
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FILING DATE: 1998-03-31
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APPLICATION NUMBER: 60/078004
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Sequence 468, Application US/09978192A
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Best Local Similarity
Matches 95; Conserv
                                              CURRENT APPLICATION NUMBER: US/09/978,192A CURRENT FILING DATE: 2001-10-15 PRIOR APPLICATION NUMBER: 09/918585 PRIOR FILING DATE: 2001-07-30 PRIOR FILING DATE: 1997-10-17 PRIOR FILING DATE: 1997-10-17
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APPLICATION NUMBER: 60/064249 FILING DATE: 1997-11-03 APPLICATION NUMBER: 60/065311
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Stewart, Timothy A.
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Grimaldi, J. Christopher
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Hillan, Kenneth J
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Kuo, Sophia S.
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APPLICATION NUMBER: 60/085689 FILING DATE: 1998-05-15 APPLICATION NUMBER: 60/085579 FILING DATE: 1998-05-15

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APPLICATION NUMBER: 60/085582 FILING DATE: 1998-05-15 APPLICATION NUMBER: 60/085700

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APPLICATION NUMBER: 60/084627 FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/084643 FILING DATE: 1998-05-07

APPLICATION NUMBER: 60/084600 FILING DATE: 1998-5-07

APPLICATION NUMBER: 60/084598 FILING DATE: 1998-05-07

APPLICATION NUMBER: 60/084640 FILING DATE: 1998-05-07

APPLICATION NUMBER: 60/084639 FILING DATE: 1998-05-07

APPLICATION NUMBER: 60/084637 FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/084441

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1998-05-06

FILING DATE: 1998-05-06 APPLICATION NUMBER: 60/084414 APPLICATION NUMBER: 60/083559 FILING DATE: 1998-04-29

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APPLICATION NUMBER: 60/082796

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APPLICATION NUMBER: 60/083499 FILING DATE: 1998-04-29

FILING DATE: 1998-04-22 APPLICATION NUMBER: 60/082797 FILING DATE: 1998-04-22

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1998-04-1998-04-21

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APPLICATION NUMBER: 60/0 FILING DATE: 1998-04-29

60/083500

APPLICATION NUMBER: 60/083742

LING DATE: 1998-04-30 LING DATE: 1998-05-05

APPLICATION NUMBER:

60/084366

DR APPLICATION NUMBER: 60/078004
DR FILING DATE: 1998-03-13
DR APPLICATION NUMBER: 60/078886
DR FILING DATE: 1998-03-20
DR APPLICATION NUMBER: 60/078936
DR FILING DATE: 1998-03-20
DR APPLICATION NUMBER: 60/078910

APPLICATION NUMBER: 60/079656
FILING DATE: 1998-03-26
APPLICATION NUMBER: 60/079664
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APPLICATION NUMBER: 60/079689
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PLICATION NUMBER: 60/078939 LING DATE: 1998-03-20 PLICATION NUMBER: 60/079294 LING DATE: 1998-03-25

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OR FILING DATE: 1998-03-10
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OR APPLICATION NUMBER: 60/077649

ILING DATE: 1998-03-11
PPLICATION NUMBER: 60/077791
ILING DATE: 1998-03-12

FILING DATE: 1997-11-13
APPLICATION NUMBER: 60/066364
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PLICATION NUMBER: 60/077450 LING DATE: 1998-03-10

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Stewart, Timothy A.
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Botstein, David
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-EANFCTGIELLVTGG 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NESKFATGSEFVVDGG 248
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SSDEDGWTKLFDATEKAFGPVSTLVNNAG-IAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RVNCISPGNIWTPLWEELAALMPDPRATIREGMLAQ----PLGRMGQPAEVGAAAVFLAS 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          95;
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                                                                              Godowski, Paul J.
Grimaldi, J. Christopher
Gurney, Austin L.
Hillan, Kenneth J
                                                                                                                                                                                                                    Fong,
                              Napier, Mary A.
                                              Kljavin, Ivar J.
Kuo, Sophia S.
                                                                                                                                                  Gerritsen, Mary E. Goddard, Audrey
                                                                                                                                                                                                                                     Filvaroff, Ellen
                                                                                                                                                                                                                                                                                                      Botstein, David
                                                                                                                                                                                                                                                                                                                       Baker Kevin P.
                                                                                                                                                                                    Gerber, Hanspeter
                                                                                                                                                                                                                                                                       Eaton, Dan
                                                                                                                                                                                                                                                                                      Desnoyers,
                                                                                                                                                                                                                                                                                                                                                                        Application US/09978189
D. US20030004102A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26.4%; Score 340; DB 9; llarity 37.1%; Pred. No. 2.7e-24; Conservative 44; Mismatches 93
                                                                                                                                                                                                    Wei-Qiang
                                                                                                                                                                                                                       Sherman
Nicholas F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1998-05-13
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APPLICATION NUMBER: 60/084600 FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/084627 FILING DATE: 1998-05-07

60/084643

FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/ FILING DATE: 1998-05-07

60/084640

APPLICATION NUMBER: 60/084598 FILING DATE: 1998-05-07

APPLICATION NUMBER: 60/084637 FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/084639

APPLICATION NUMBER:

1998-05-06

60/084441

APPLICATION NUMBER: 60/084414 FILING DATE: 1998-05-06

1998-05-05

APPLICATION NUMBER: 60/084366

APPLICATION NUMBER: 60/083742

1998-04-29 1998-04-29

60/083500

APPLICATION NUMBER:

APPLICATION NUMBER: 60/083558 FILING DATE: 1998-04-29

FILING DATE:

APPLICATION NUMBER: 60/083554

1998-04-29 1998-04-29 1998-04-29

60/083545

APPLICATION NUMBER:

FILING DATE:

CATION NUMBER:

60/083336

1998-04-

60/083322

CATION NUMBER: 60/083392

60/083495

ATION NUMBER: 60/083496 DATE: 1998-04-29 DATE: 1998-04-29

ON NUMBER: 60/083499

LING DATE:

CATION NUMBER: 60/082796

1998-04-23

1998-04-

60/082797

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APPLICATION NUMBER: 60/082700

1998-04-23 1998-04-22 1998-04-21 1998-04-2

60/082804

APPLICATION NUMBER: 60/082704

APPLICATION NUMBER:

APPLICATION NUMBER: 60/083559

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NPPLICANT: Williams, P. Mickey
NPPLICANT: Wood, William I.
NITLE OF INVENTION: Secreted and Transmembrane Polypeptides and Nucleic
NITLE OF INVENTION: Acids Encoding the Same
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RIOR APPLICATION NUMBER: 09/918585
RIOR EILING DATE: 2001-07-30
RIOR APPLICATION NUMBER: 60/062250
RIOR FILING DATE: 1997-10-17
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RRENT FILING DATE: 2001-10-15
                                DR FILING DATE: 1998-03-31

DR APPLICATION NUMBER: 60/080194

DR FILING DATE: 1998-03-31

DR APPLICATION NUMBER: 60/080327

DR FILING DATE: 1998-04-01

DR APPLICATION NUMBER: 60/080328

DR FILING DATE: 1998-04-01
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OR FILING DATE: 1997-11-13
OR POLICATION NUMBER: 60/066364
OR FILING DATE: 1997-11-21
OR APPLICATION NUMBER: 60/077450
OR FILING DATE: 1998-03-10
                                                                                                                                                                                                                                                                                                                                          FILING DATE: 1998-03-27

APPLICATION NUMBER: 60/079786

FILING DATE: 1998-03-27

APPLICATION NUMBER: 60/079920

FILING DATE: 1998-03-27
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FILING DATE: 1998-03-31
APPLICATION NUMBER: 60/080165
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FILING DATE: 1998-03-30
APPLICATION NUMBER: 60/080105
FILING DATE: 1998-03-31
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FILING DATE: 1998-03-20
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FILING DATE: 1998-03-27
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APPLICATION NUMBER: 60/
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FILING DATE: 1998-03-11
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FILING DATE: 1998-03-11
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FILING DATE: 1997-11-03
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FILING DATE: 1998-03-12
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Shelton, David L.
Stewart, Timothy A.
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               MBER: 60/080333
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FILING DATE: 1998-05-06
APPLICATION NUMBER: 60/084441
FILING DATE: 1998-05-06
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FILING DATE: 1998-04-29
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APPLICATION NUMBER: 60/082797
FILING DATE: 1998-04-22
APPLICATION NUMBER: 60/084639 FILING DATE: 1998-05-07
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FILING DATE: 1998-04-22
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FILING DATE: 1998-04-15
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FILING DATE: 1998-04-15
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APPLICATION NUMBER: 60/081195
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FILING DATE: 1998-04-22
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FILING DATE: 1998-04-09
APPLICATION NUMBER: 60/081229
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FILING DATE: 1998-05-07 APPLICATION NUMBER: 60/084598 FILING DATE: 1998-05-07

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PRIOR APPLICATION NUMBER: 60/085580
PRIOR FILING DATE: 1998-05-15
PRIOR APPLICATION NUMBER: 60/085573
PRIOR APPLICATION NUMBER: 60/085704
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PRIOR APPLICATION NUMBER: 60/085704
PRIOR APPLICATION NUMBER: 60/085704
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                                                                                       178 RVNCISPGNIWTPLWEELAALMPDPRATIREGMLAQ----PLGRMGQPAEVGAAAVFLAS 233
                                                                                                            182 RVNTVHPGYIKTPLVDDL-----PGA---EEAMSQRTKTPMGHIGEPNDIAYICVYLAS 232
                                                                                                                                                                          233 NESKFATGSEFVVDGG 248
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DR FILING DATE: 1998-05-07
DR APPLICATION NUMBER: 60/084643
DR FILING DATE: 1998-05-07
DR APPLICATION NUMBER: 60/085339
DR FILING DATE: 1998-05-13
                                                                                                                                                                                                                                                                    63 VTQEDDVKTLVSETIRRFGRLDCVVNNAGHHPPPQRPEETSAQGFRQLLELNLLGTYTLT 122
                                                                                                                                                                                                                                                                                                                64 SSDEDGWTKLFDATEKAFGPVSTLVNNAG-IAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: 60/085582 FILING DATE: 1998-05-15 APPLICATION NUMBER: 60/085700
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FILING DATE: 1998-05-13
APPLICATION NUMBER: 60/085323
FILING DATE: 1998-05-13
-EANFCTGIELLVTGG 248
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Search completed: April 22, 2003, 17:21:49
Job time: 27 secs

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Result
No.
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Listing first 45 summaries
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Maximum DB
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Sequence:
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      470
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407.5
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| RESULT | Qy : | Дb | рь | Оy | D Qy | Query M Best Lo Matches | RESULT 1 E87279 hypothetic C; Species: C; Date: 20 C; Accessio R; Nierman, B; Laub, n, J; Erm Proc. Natl A; Title: C A; Reference A; Reference A; Accessio A; Status: A; Molecule A; Residues A; Gene: CC C; Superfam | | 30 30 30 30 30 30 30 30 30 30 30 30 30 3 |
|--------|--|---|--|--|---|---|---|------------|---|
| N | 229 YLASNESKFATGSEFVVDGGYTA 251 : : : 238 YLASDESKFMTGAEIKVDGGISA 260 | 173 DCALKDYDVRVNTVHPGYIKTPLVDDLPGABEAMSQRTK-TPMGHIGEPNDIAYICV | 113 VNLDGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAAL | 59FFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLA | 2 SNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQ | Match 36.4%; Score 470; DB 2; Jocal Similarity 40.7%; Pred. No. 4.3e-30; S 107; Conservative 46; Mismatches 90; | les: Caulobacter crescentus : 20-Apr-2001 #sequence_revision 20-Apr-20 ssion: E87279 nan, W.C.: Feldblyum, T.V.: Paulsen, I.T.: Ermblaeva, M.: White, O.: Salzberg, S.L.: Sand: Sci. U.S.A. 98, 4136-4141, 200 seconombete Genome Sequence of Caulobacter crence number: A87249; MUID:21173698; PMID: ssion: E87279 ssion: E87279 ssion: E87279 ssion: E87279 ssion: E87279 ssion: E87279 ssion: Genome Sequence of Caulobacter crence number: A87249; MUID:21173698; PMID: sreferences: GB:AB005673; NID:g13421377; cfcmily: ribitol dehydrogenase; short-chal | ALIGNMENTS | 355.5 27.6 261 2 139853 352.5 27.3 261 2 140224 351.5 27.2 251 2 G72389 351 27.2 256 2 G83378 350 27.1 257 2 372395 348.5 27.0 258 2 G69755 348.5 26.9 243 2 F83838 346.5 26.9 255 2 D72377 346.5 26.8 267 2 T44361 346.26.8 267 2 AH2362 349.26.6 299.2 T44064 343.5 26.6 299.2 D90481 342.5 26.6 299.2 D90481 342.5 26.6 267 2 T11579 340 26.4 241 2 AI2916 |
| | | -GAEEAMSORTK-TÞMGHIGEÐNDIAYICV 228 :: : : :: FGKEEAFAKLARQVÞLGRIGEÐTDIANAVL 237 | YNASKGAVRIMSKSAAL 172 :: : YNASKAAVWLLSKNIAL 177 | NKSVEETTTAEWRKLLA 112 : | RHSDVGEKAAKSVGTPDQIQ 58 | Length 261; Indels 20; Gap | octer crescentus ol #text_change 10-May-2001 Nelson, K.E.; Eisen, J.: Heidelber in, A.S.; Gwinn, M.L.; Haft, D.H.; Shapiro, L.; Venter, J.C.; Fraser, 1 crescentus. 11259647 pidn:AAK22233.1; GSPDB:GN00148 pidn:AAK22233.1; GSPDB:GN00148 | | glucose 1-dehydrog slucose 1-dehydrog oxidoreductase, sh probable short-cha oxidoreductase, sh slucose 1-dehydrog oxidoreductase (sh oxidoreductase (sh oxidoreductase) sh acetoacetyl-CoA re hypothetical prote short-chain alcoho probable dehydroge hypothetical prote probable short cha probable short cha probable short cha probable short cha probable short cha probable short cha probable sluconate acetoacetyl CoA re |

H70758

H70758

probable fabG3 protein - Mycobacterium tuberculosis (strain H37RV)

C:Species: Mycobacterium tuberculosis

C:Species: Mycobacterium tuberculosis

C:Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000

C:Accession: H70758

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FEBS Lett. 266, 51-54, 1990
A;Title: Prokaryotic 20-beta-hydroxysteroid dehydrogenase is an enzyme of the 'short-cha' A;Reference number: S10707; MUID:90306362; PMID:2194840
A;Accession: S10707
                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: protein A; Residues: 1-255 < MAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20beta-hydroxysteroid dehydrogenase (EC 1.1.1.-) - Streptomyces exfoliatus C;Species: Streptomyces exfoliatus C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           k;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Gordon, Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Holroyd, Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Reference number: A70500;
A;Accession: H70758
                                                                                                                                                                                                                                                                                                                 Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase homology Keywords: NAD; oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                             Status: preliminary
                                                                                                                                                                                                                 Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Status: preliminary; nucleic acid sequence not shown; translation not shown
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                                                                DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
                         DYTIEEDWQRVVAYAREEFGSVDGLVNNAGISTGMFLETESVERFRKVVDINLTGVFIGM
                                                                                                                                                     NRLDGKVAIITGGTLGIGLAIATKEVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFFQH 62
                                                                                                              NDLSGKTVIITGGARGLGAEAARQAVAAGARVVLADVLDEEGAATARELG--DAARYQHL 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD 180
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                                                                                                                                                                                                        31.6%; Score 407.5; DB 1; 39.0%; Pred. No. 3.9e÷25; tive 42; Mismatches 103;
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                                                                                                                                                                                                                                                 DB 1; Length 255;
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A;Cross-references: EMBL:X73124; NID:g413923; PIDN:CAA51638.1; PID:g414006
A;Note: the nucleotide sequence was submitted to the EMBL Data Library, June 1993
R;Kunst, F: Ogasawara, N.; Moszer, I.; Albertin, A.M.; Alloni, G.; Azevedo, V.; Ber
C.; Bron, S.; Brouillet, S.; Bruschi, C.V.; Caldwell, B.; Capuano, V.; Carter, N.M.;
A.; Ehrlich, S.D.; Emmerson, P.T.; Entian, K.D.; Errington, J.; Fabret, C.; Ferrari,
Nature 390, 249-256, 1997
Nature 390, 249-256, 1997
Nature 390, 249-256, 1997
Nature 390, 249-256, 1997
Nature 390, 249-256, 1997
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Nature 390, 249-256, 1997
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Nature 390, 249-256, 1997
Nature 390, 249-256, 1997
Nature 390, 249-256
Nature 390, 249-256, 1993
Nature 390, 249-256, 1997
Nat
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C;Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase homology
C;Keywords: NAD; oxidoreductase
F;8-185/Domain: short-chain alcohol dehydrogenase homology <SADH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross-references: GB:Z99123; GB:AL009126; NID:g2636240; A;Experimental source: strain 168 C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Molecule type:
A; Residues: 1-255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A:Status: preliminary; nucleic acid sequence not shown; translation not shown
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R;Glaser, P.; Kunst, F.; Arnaud, M.;
A.; Rapoport, G; Danchin, A.
Mol. Microbiol. 10, 371-384, 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glucose 1-dehydrogenase homolog ywfD - Bacillus subtilis
N;Alternate names: protein 1pa-82d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Status: preliminary; nucleic acid sequence not shown; translation not
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Species: Bacillus subtilis
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 16-Jun-2000
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                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
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                                                                                                                                                                                                                                                                                                                                                                                         Local
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QTDITDEAACQHAVESAVHTFGGLDVLINNAGIEIVAPIHEMELSDWNKVLQVNLTGMFL 119
                                                                            QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                     MIMNLTDKTVLITGGASGIGYAAVQAFLGQQANVVVADIDEAQGEAMVRKENN-DRLHFV 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VNTVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIG-EPNDIAYICVYLASNESKFATGS 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAVNASKGAVRIMSKSAALDCALKDYDVR 182
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Similarity 37.1%;
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Pred. No. 1.4
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                                                                                                                                                                                                                                                                                                                                                                            1.4e-24;
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                                                                                                                                                                                                                                                                                                                                      11;
                                                                                                                                                                                                                                                                                                                              Gaps
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GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD 180

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A:Cross-references: EMBL:L08971; NID:g309859; PIDN:AAA25742.1; PID:g309860 A;Note: the source is designated as Pseudomonas testosteroni C:Superfamily: ribito1 dehydrogenase; short-chain alcohol dehydrogenase homology C:Keywords: oxidoreductase C:Keywords: oxidoreductase F:2-254/Product: 3(or 17)beta-hydroxysteroid dehydrogenase #Status experimental F:8-185/Domain: short-chain alcohol dehydrogenase homology <SADH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Nolecule type: protein
A; Nolecule type: protein
A; Residues: 2-40,'E',41-176,178-240,'G',242-254 <YIN>
A; Note: the source is designated as Pseudomonas testosteroni
A; Note: the source is designated as U.C.T.; Haegglund, O.; Johnson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R.Abalain, J.H. submitted to the EMBL Data Library, **Peference number: $51780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R;Benach, J.; Knapp, S.; Oppermann, U.C.T.; Haegglund, O.; Joe Eur. J. Biochem. 236, 144-148, 1996
A;Title: Crystallzation and crystal packing of recombinant 3
A;Reference number: S62216; MUID:96184891; PMID:8617258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: EMBL:X63379; NID:g312918; PIDN:CAA44977.1; PIT A;NOTE: the source 1s designated as Pseudomonas testosteron1 R;Y1n, S.J.; Vagelopoulos, N.; Lundquist, G.; Joernvall, H. Eur. J. Biochem. 197, 359-365, 1991 Eur. Biochem. 197, 359-365, 1991 A;Title: Pseudomonas 3-beta-hydroxysteroid dehydrogenase. Primary A;Reference number: S15390; MUID:91224127; PMID:2026158 A;Accession: S15390
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G; Date: 14-Jul-1995 #sequence_revision 01-Dec-1995 #text_change 08-Oct-1999

G; Accession: S48129; S51780; S15390; S62216; S62182

R; Abalain, J.H.; di Stefano, S.; Amet, Y.; Quemener, E.; Abalain-Colloc, M.L.;

J; Steroid Biochem. Mol. Biol. 44, 133-139, 1993
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A;Description: Nucleotide sequence of the beta-hydroxyste: A;Reference number: S62182
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A; Residues: 1-40, 'E', 41-176, 178-254 <BOC>
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A; Residues: 1-254 <ABA>
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A;Reference number: S48129; MUID:93176721; PMID:8382516
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Molecule type: DNA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Molecule type: DNA Residues: 1-13,'VV',16-254 <ABW>
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Note: the source is designated as
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                                                           MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF 60
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             MTNRLQGKVALVTGGASGVGLEVVKLLLGEGAKVAFSDINA-AGQQLAAELG--ERSMFV 57
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                                                                                                                                                 Similarity
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                                                                                                                                                                                                                          : 3(or 17)beta-hydroxysteroid dehydrogenase #status
short-chain alcohol dehydrogenase homology <SADH>
                                                                                                                                               30.5%;
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                                                                                                                                         Score 393; DB 2;
Pred. No. 5.6e-24;
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                                                                                                                                                                                                                        dehydrogenase homology
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                                                                                                                    Mismatches
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                                                                                                                                                                  Length 254;
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    Comamonas testosteroni (ATCC

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                                                                                                                                                                                                                                                                                           RESULT 7
E72427
                                                                                                                                                                                                       oxidoreductase, short chain dehydrogenase/reductase family · Thermotoga maritima C:Species: Thermotoga maritima C:Date: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Jul-2000
A;Reference number: A72200; MUID:99287316; PMID:10360571 A;Accession: E72427
                                                                                                                                    R; Nelson, K.E.; Clayton, R.A.; Gill, Garrett, M.M.; Stewart, A.M.; Cotton,
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                                                                                   Nature 399,
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Gill, S.R.;

Gwinn, M.L.; Pratt,

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Dodson, R.J.; Haft, Phillips, C.A.; Ri

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Bacteria

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M.D.;

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A;Cross-references: EMBL:X79863; NID:g520947; PIDN:CAA56245.1; PID:g520952 C;Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase homeology <SADH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hypothetical protein 5 - Xanthobacter sp.
C;Species: Xanthobacter sp.
C;Date: 19-Mar-1997 #sequence_revision 19-Mar-1997 #text_change
C;Accession: S47055
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S47055
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A;Description: Plementation of Xanthobacter Py2 mutants in epoxyalk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-249 <SWA>
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A;Accession: S47055
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GSEFVVDGGYTA
                                                VVCPGTVAGTDMGRQLLGTDCDPELEARRLAKYPMGRFGTPEDIAEAAVFLLSTKAAFVT
                                                                               TVHPGYIK-TPLVDDLPGAE---EAMSQR-TKTPMGHIGEPNDIAYICVYLASNESKFAT
                                                                                                                                                  ALFGMLERGRGA-IVNFGSVAGLVGIPTMAAYCAAKGAVVNLTROMAADYSGR--GIRVN
                                                                                                                                                                                             GIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVRVN 184
                                                                                                                                                                                                                                                TDEAAITAAMAGAQRALGPLTGLVNNAGIAGFGSVHATEVETWSRIMAVNVTGTFLASKA 119
                                                                                                                                                                                                                                                                                               SDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTRL 124
                                                                                                                                                                                                                                                                                                                                               LDAEVIAITGGAAGIGLAVAHAAIRAGARVALIDRDGACAQRAAAEFGA--AAWGVGADV
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Pred. No. 7.9e-24
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C;Superfamily: 1
F;8-186/Domain:
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                                                                                                                                                                                                                                                                                                                                                                                                                         A;Cross-references: GB:Z75555; GB:AL123456; NID:g3261608; PIDN:CAA99983.1; PID:g1419053
A;Experimental source: strain H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G.
A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete
A;Reference number: A70500; MUID:98295987; PMID:9634230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                probable fabG2 protein - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Residues: 1-256 < ARN>
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A:Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                 Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase homology 8-186/Domain: short-chain alcohol dehydrogenase homology <SADH>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Molecule type: DNA
                                                                                                                                                                                                                                                                  Matches
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Experimental source: strain MSB8
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Best Local Similarity
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                                                                                                                                                                                       60
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GTRLAAAIMRERKRGA-IVNMSSVSGKVGMVGQTNYSAAKAGIVGMTKAAAKE--LAHLG
                                       GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD 180
                                                                                RCDVTQADDVDILIRTAVERFGGLDVMVNNAGITRDATMRTMTEEQFDQVIAVHLKGTWN 120
                                                                                                                      QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                    MASLLNARTAVITGGAQGLGLAIGQREVAEGARVVLGDVNLEATEVAAKRLGGDDVALAV 60
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                                                                                                                                                                                                                                                                                   Similarity
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                                                                                                                                                                                                                                                  Score 380; DB z; Pred. No. 5.8e-23; """ matches 94;
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Pred. No. :
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  177
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                                                        RESULT 10
B95284
      probable (imported) - Sinorhizobium meliloti (strain 1021) magaplasmid pSymA
C; Species: Sinorhizobium meliloti
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C;Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase
F;7-182/Domain: short-chain alcohol dehydrogenase homology <SADH>
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A; Residues: 1-248 <KUN>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Cross-references: GB:Z99111; GB:AL009126; NID:g2633699; PIDN:CAB13250.1; PID:g26337
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Matches
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                                                                                                                                                                                                                                                                                  184 NTVHPGYIKTPLVDDLPG--AEEAM-SQRTKTPMGHIGEPNDIAYICVYLASNESKFATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124 LGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVRV 183
                                                                                                  241 SEFVVDGG 248
                                                                                                                                                                                                                                                                                                                                                                                          121 KALSLEPDK--VGSIIVTGSTAGSIGNPAFSVYGASKAALRALVRNWILD--LKGTEIRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 ISKLEDLDKLYDIIKQEKGKLDILFANAGIGNFLPLGEITEEQVDRTFDINVKGTIFTVQ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3 KFEGKIALVTGGTSGIGLATAQKFVNEGAYVYITGRRQNELDKAVNQIG--KNVTGVQGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4 RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFFQHD : :| | : | : | : | : | : | : | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : 
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VELFVDGG
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     244
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24-Aug-2001

#sequence_revision 24-Aug-2001 #text_change 30-Sep-2001

Length

261;

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A;Cross-references: GB:D90043; NID:g216265; PIDN:BAA14099.1; PID:g216268
A;Experimental source: strain IAM1030
C;Complex: homotetramer
C;Function:
                                                                                                                                                                                                                                                                                                                                   glucose 1-dehydrogenase (EC 1.1.1.47) - Bacillus megaterium C:Species: Bacillus megaterium C:Date: 07-Sep-1990 #sequence_revision 07-Sep-1990 #text_change C:Accession: 13985; JS0385
R:Mitamura, T.; Ebora, R.V.; Nakai, T.; Makino, Y.; Negoro, S.; J. Ferment. Bloeng. 70, 363-369, 1990
A:Title: Structure of isozyme genes of glucose dehydrogenase fro
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A;Experimental source: strain 1021, megaplasmid pSymA
R;Galibert, F: Filan, T.M.; Long, S.R.; Puhler, A.; Abola, P.; Ampe, F.; Ba
pela, D.; Chain, P.; Cowie, A.; Davis, R.W.; Dreano, S.; Federspiel, N.A.; F
L.; Hyman, R.W.; Jones, T.
Science 293, 668-672, 2001
A;Authors: Kahn, D.; Kahn, M.L.; Kalman, S.; Keating, D.H.; Kiss, E.; Komp, A;Authors: Kahn, D.; Wahn, M.; Vorholter, F.J.; Weidner, S.; Wells, D.H.; Wong, A;Title: The composite genome of the legume symbiont Sinorhizobium meliloti.
A;Reference number: A96039; MUID:21368234; PMID:11474104
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R;Barnett, M.J.; Fisher, R.F.; Jones, T.; Komp, C.; Abola, A.P.; Barloy-Hubler, F.; Bows R;Barnett, M.J.; Fisher, R.F.; Jones, T.; Komp, C.; Abola, A.P.; Barloy-Hubler, F.; Bows R;Barnett, M.J.; Fisher, R.F.; Palm, C.; Peck, M.C.; Surzycki, R.; Wells, D.H.; Yeh, K.C. Proc. Natl. Acad. Sci. U.S.A. 98, 9883-9888, 2001

A;Title: Nucleotide sequence and predicted functions of the entire Sinorhizobium melilot A;Reference number: A95262; MUID:21396509; PMID:11481432

A;Accession: B95284
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                   A;Description: catalyzes NAD(P)-dependent dehydrogenation of D-glucose. C:Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase C:Keywords: oxidoreductase
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                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-261 < RES>
                                                                                                                                                                                                                                                                                                A; Reference number: A; Accession: 139852
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C;Genetics:
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A; Residues: 1-253 <KUR>
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97; Conserv
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D.H.; Wong,
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N.A.; Fisher, R.F.
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J. Biol. Chem. 264, 6381-6385, 1989
A;Title: Stability-increasing mutants of glucose dehydrogenase A;Reference number: A33528; MUID:89197943; PMID:2495285
A;Reference number: A33528
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C;Species: Bacillus megaterium
C;Date: 29-Jan-1990 #sequence_revision 29-Jan-1990 #text_ch
C;Accession: A33528
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Pred. No. 3e-2
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Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete A;Reference number: A70500; MUID:98295987; PMID:9634230
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   probable dehydrogenase - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Species: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
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                                                                                                                                 C;Superfamily: ribitol dehydrogenase; short-chain alcohol dehydrogenase homology
F;11-188/Domain: short-chain alcohol dehydrogenase homology <SADH>
                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-258 <COL>
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                                                                                                                                                                                          A; Gene: Rv2857c
                                                                                                                                                                                                                                          A;Experimental
                                                                                                                                                                                                                                                                                                                                                        A; Accession: C70885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
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R;Bolotin, A.; Wincker, P.; Mauger, S.; Jaillon, O.; Malarme, Genome Res. 11, 731-753, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-253 <STO>
A; Cross-references: GB:AE005176; PID:g12723829; PIDN:AAK04996.1;
A; Experimental source: strain IL1403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Title: The complete genome sequence of the lactic acid bacterium Lactococcus A;Reference number: A86625; MUID:21235186; PMID:11337471 A;Accession: B86737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C:Date: 23-Mar-2001 #sequence_revision 23-Mar-2001 #text_change 03-Aug-200.
C:Accession: B86737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N;Alternate names: acetoin reductase
C;Species: Lactococcus lactis subsp. lactis
                                 Query Match
Best Local Similarity 35.7
2- 92; Conservative
                                                                                                                                                                                                                                        Cross-references: GB:AL008883; GB:AL123456; NID:g3261490; Experimental source: strain H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Accession: C70885
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Matches
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                                                                                                                                                                                                                     enetics:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121 LFRKLGHGGKIINATSQAGVVGNPNLMLYSSSKFAVRGMTQIAARD--LAEEGITVNAYA 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3 KIAAVTGAGQGIGFAIAKRLYNDGFKVAIIDYNEETAQKAAKELG--ENSFAIKADVSDR 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
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MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATGSEFVVDGG 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EQVISALNAVVDKFGDLNVVVNNAGIAPTTQIETITPEQFHQVYNINVGGVLWGTQTSTA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGYIKTPLVDDL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFEGTRLGIQ 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFFQHDSSDE 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ITGQTIIVDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PGIVKTPMMFDIAHQVGKNAGKDDEWGMQTFAKDIAMKRLSEPEDVANVVSFLAGPDSNY
                                                                                                                                                                                                                                     source:
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                                                                   28.4%; Score 367; DB 2; 35.7%; Pred. No. 6.7e-22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -PGAEEAMSQRT----KTPMGHIGEPNDIAYICVYLASNESKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      48; Mismatches
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Pred. No. 5.4e-22;
                                                  Mismatches
                                                    105;
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                                                                                      Length 258
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                                                                                                                                                                                                                                               PIDN:CAA15519.1; PID:g26128
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                                             Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Cross-references: GB:BA000018; pID:gl3702422; pIDN:BAB43563.1; A;Experimental source: strain N315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Species: Staphylococcus aureus
C;Date: 10-May-2001 #sequence_revision 10-May-2001 #text_change 22-Oct-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
A; Residues: 1-272 <KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Title: Whole genome sequencing of meticillin-resistant A;Reference number: A89758; MUID:21311952; PMID:11418146 A;Accession: A99950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C; Accession: A99950
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C.; Shiba, T.; Hattori, M.
Lancet 357, 1225-1240, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         hypothetical protein SA2260 [imported] - Staphylococcus aureus (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
  238
                                                                               178
                                                                                                                                                   122 TKMMLPLMMNQ--GGSIVNTSSFSGQAEDLYRSGYNAAKGAVINFTKSIAIEYG-RD-GI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 235
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                                                                                                                                                                                     122 TRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  234 ESKFATGSEFVVDGGYTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             117
                                                                                                                                                                                                                              63 ISDEQQVVDFVSDIKEQFGRIDVLFNNAGVDNAAGR-IHEYPIDVYDKIMNVDMRGTILM
                                                                                                                                                                                                                                                                     64 SSDEDGWTKLFDATEKAFGPVSTLVNNAGI--AVNKSVEETTTAEWRKLLAVNLDGVFFG 121
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                          SKFATGSEFVVDGGYTA 251
                                                                         RSNAIAPGTIETPLVDKLTGTSEDDAGKTFRENQKWMTPLGRLGKPEEVAKLVVFLASDD
SSFITGETIRIDGGVMA
                                                                                                            RVNTVHPGYIKTPLVDDLPGAEE-----AMSQRTKTPMGHIGEPNDIAYICVYLASNE 234
                                                                                                                                                                                                                                                                                                          RLENKVAVVTGASTGIGQASAIALAQEGAYVLAVDIAEAVSETVDKIKSNGDNAKAYNVD
                                                                                                                                                                                                                                                                                                                                                   RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFFQHD
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                                                                                                                                                                                                                                                                                                                                                                                              44; Mismatches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                Score 366; DB 2;
Pred. No. 8.6e-22;
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                                                                                                                                                                                            181
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Search completed: April 22, Job time : 22 secs 2003, 17:16:52

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Result
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Maximum Match 100%
Listing first 45 summaries
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Maximum DB
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         Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
       441.5
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1290
1 MSNRLDGKVAIITGGTLGIG.....NESKFATGSEFVVDGGYTAQ 252
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InterPro; IPR002198; ADH_short.

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                                                                                                                                                                                                                                                                                                                               "Cioning and sequencing or a "." "" "" "" gamma-dehydrogenase gene involved in the degradation of gamma-hexachlorocyclohexane in Pseudomonas paucimobilis.";

J. Bacteriol. 176:3117-3125(1994).

-i - FUNCTION: DEGRADATION OF 2.5-DICHLORO-2,5-CYCLOHEXADIENE-1,4-DIOL-1-FUNCTION: DEGRADATION OF 2.5-DICHLOROHYDROQUINONE (2,5-DCHQ). LINX IS NOT
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                                          use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See or send an email to license@isb-sib.ch).
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P50198;
  EMBL;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pseudomonas paucimobilis (Sphingomonas paucimobilis).
Bacteria: Proteobacteria; alpha subdivision; Sphingomonadaceae;
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2,5-dichloro-2,5-cyclohexadiene-1,4-diol dehydrogenase
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                                                                                                                                         s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its
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PATHWAY: DEGRADATION OF GAMMA-HCHOROCYCLOHEXANE
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D23722; BAA04939.1;
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                                                                                                                                                                                                                                                                          BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
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174
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42.2%;
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BY SIMILARITY:

S -> G (IN REF. 2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44;
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Pred. No. 6.
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0935A14ED36220B7
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                                                                 http://www.isb-sib.
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2BHD_STREX
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P19992;
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ACT_SITE
SEQUENCE
                                                                                                                dehydrogenase: a member of a short-chain dehydrogenase fa
Proc. Natl. Acad. Sci. U.S.A. 88:10064-10068(1991).
-i- CATALYTIC ACTIVITY: Androstan-3-alpha,17-beta-diol +
                                                                                                                                                                  X-RAY CRYSTALLOGRAPHY (2.6 ANGSTROMS)
MEDLINE=92052211; Pubmed=1946424;
Ghosh D., Weeks C.M., Grochulski P.,
Rimsay R.L., Orr J.C.;
                                                                                                                                                                                                                                                                                                                         01-NOV-1997 (Rel. 35, Last annotation update)
20-beta-hydroxysteroid dehydrogenase (EC 1.1.1.53).
Streptomyces exfoliatus (Streptomyces hydrogenans).
Bacteria; Actinobacteria; Actinobacteria (class); Ac
Actinomycetales; Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                       01-FEB-1991 (Rel. 17, Created)
01-FEB-1991 (Rel. 17, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation updat
                                                                                                                                                                                                                                         MEDLINE=90306362; PubMed=2194840;
Marekov L., Krook M., Joernvall H.;
"Prokaryottc.20 beta-hydroxysteroid
'Short-chain, non-metalloenzyme' ald
                     InterPro;
                                                                                                                                                      *Three-dimensional structure of holo 3 alpha,
                                                                                                                                                                                                                                 FEBS
                                                                                                                                                                                                                                                                                                                NCBI_TaxID=1905;
                                                                                                                                                                                                                                                                                            SEQUENCE
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PROSITE; PS00061; ADH_SHORT; 1.
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SUBUNIT: HOMOTETRAMER.
SIMILARITY: BELONGS TO THE S
                                                                    (SDR) FAMILY
                               2HSD; 31-AUG-94
1HDC; 07-FEB-95
                                                          S10707; S10707
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                     IPR002198; ADH_short
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250 AA;
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                                                                             THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                       ANGSTROMS).
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                                                                                                        NADH.
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                                                                                                                                        ,20 beta-hydroxysteroid
ydrogenase family.";
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type.";
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PF00106; adh_short; PR00080;

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XX MEDLINE-98044033; PubMed-9384377;
XX Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G.,
XX Kunst F., Ogasawara N., Moszer I., Albertini A.M., Borchert S.,
XX Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
XX Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,
XX Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
XX Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T.,
XX Entian K.D., Errington J., Fabret C., Ferrari E., Foulger D.,
XX Fritz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N.,
XX A Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G.,
XX Guiseppi G., Guy B.J., Haga K., Halech J., Harwood C.R., Henaut A.,
XX Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
XX Hilbert B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,
XX Kobayashi Y., Koetter P., Koningstein G., Kroph S., Kumano M.,
XX Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
XX Lee S.M., Levine A., Liu H., Masuda S., Mauel C., Medigue C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local 9
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                                                                                                                                                                                                                                                                                                                                                             MEDLINE=9502033; runned-, Coudart M.P., Gonzales W., Glaser P., Kunst F., Arnaud M., Coudart M.P., Gonzales W., Hullo M.F., Ionescu M., Lubochinsky B., Marcelino L., Mosze, Hullo M.F., Ionescu M., Schneider E., Schweizer J., Vertes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-FEB-1995 (Rei. 31, Created)
01-FEB-1995 (Rel. 31, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update).
Hypothetical oxidoreductase ywfD (EC 1.-.-).
                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                  Presecan E., Santana M., Schneider Rapoport G., Danchin A.;
                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=95020537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacillus subtilis.
Bacteria; Firmicutes;
NCBI_TaxID=1423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hypothetical oxidoreductase YWFD OR IPA-82D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BACSU
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                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
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InterPro; IPR002198; ADH_Short.
InterPro; IPR00106; adh_Short; 1.
Pfam; pP00106; adh_Short; 1.
PRINTS; PR00061; ADH_SHORT; 1.
PROSITE; PS00061; ADH_SHORT; 1.
PROSITE; PS00061; ADH_SHORT; 1.
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MEDLINE-992B7316; pubMed-10360571;

Nelson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,

Nelson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,

Haft D.H., Hickey E.K., Peterson J.D., Nelson W.C., Ketchum K.A.,

McDonald L., Utterback T.R., Malek J.A., Linher K.D., Garrett M.M.,

Stewart A.M., Cotton M.D., Pratt M.S., Phillips C.A., Richardson D.,

Heldelberg J., Sutton G.G., Fleischmann R.D., Eisen J.A., White O.,

Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.;

"Evidence for lateral gene transfer between Archaea and Bacteria from genome sequence of Thermotoga maritima.";

Nature 399:323-329(1999).

1- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
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"Molecular and phylogenetic characterization of pyruvate and ketolsovalerate ferredoxin oxidoreductases from Pyrococcus fund pyruvate ferredoxin oxidoreductase from Thermotoga mariti
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PubMed-8550425;
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153
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                                                                                                                                                                                                                                                             29.7%;
-SEWKKKSLRKKPDLRPIDHEQHPAGRVGNPLDIAHLCVFLA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TM0019 (EC 1.-.-).
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BY SIMILARITY.
RGGGVII -> TRWRSDH (
W; D68160B1D7980C6B C
                                                                                                                                                                                                                                          Pred. No. 2.9
                                                                                                                                                                                                                                                           Score 383;
Pred. No. 2.
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                                                                                                                                                                                                                                                           DB 1;
.9e-24;
                            PMGHIGEPNDIAYICVYLA
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CRC64;
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Matches

Similarity

Length Indels

247;

16;

Conservative

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MEDLINE=98295987; PubMed=9634230;

RA Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris RA Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F.,

RA Badcock K., Basham D., Brown D., Chillingworth T., Connor R.,

RA Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd:

RA Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L.,

RA Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J.,

RA Rutter S., Seeger K., Skelton S., Squares S., Squares R.,

RA Rutter S., Seeger K., Skelton S., Squares S., Squares R.,

Ca Sulston J.E., Taylor K., Whitehead S., Barrell B.G.;

Tomplete genome sequence.*;

I. Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 6
YD50_MYCTU
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     Query Match
Best Local
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                                                                                                            PRINTS; PR00080; SDRFAMILY. PROSITE; PS00061; ADH_SHORT; 1.
                                                                                                                                                                                                                             EMBL; 275555; CAA99983.1; -. EMBL; AE007012; AAK45656.1;
                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Ex
                                                                                                                                                                                                                                                                                                                                                                                                                          laboratory strains.";
Submitted (APR-2001) to
-!- SIMILARITY: BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-CDC 1551 / Oshkosh;
Fleischmann R.D., Alland D., Elsen J.A., Carpenter
Peterson J., DeBoy R., Dodson R., Gwinn M.L., Haft
Kolonay J.F., Nelson W.C., Umayam L.A., Ermolaeva
Delcher A., Utterback T., Weldman J., Khouri H., G
                                                                                               Hypothetical protein;
                                                                                                                                              Pfam; PF00106; adh_short; 1.
                                                                                                                                                           InterPro; IPR002198; ADH_short
                                                                                                                                                                                TubercuList; Rv1350;
                                                                                                                                                                                                  TIGR; MT1393;
                                                                                                                                                                                                            HSSP; 070351; 1E3S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bishai W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis.

Mycobacteria; Actinobacteria; Actinobacteria (class); Actinobacteridae;

Bacteria; Actinobacteria; Actinobacteridae;

Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-OCT-1996 (Rel. 34, Created)
01-OCT-1996 (Rel. 34, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Putative oxidoreductase Rv1350 (EC 1.---)
FABG2 OR RV1350 OR MT1393 OR MTCY02B10.14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Whole genome comparison of Mycobacterium tuberculosis clinical
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DDEKAGFITGTNFIVDGGMTVK 251
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29.5%;
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THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                                                                          is not removed
                                              eductase; NAD; Complete
NAD (BY SIMILARITY).
BY SIMILARITY.
;. 76CAO7892E7BBA73 CRC6
 Score 380;
Pred. No. 4.
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 . 8e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Carpenter L., White O., M.L., Haft D., Hickey E., Ermolaeva M.D., Salzberg ouri H., Gill J., Mikula
                                                                                                                                                                                                                                                                                                                           as
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                                                                                                                                                                                                                                                                                                                           its content
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DHG1_BACME
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     Query Match
Best Local Similarity
Matches 88; Conserv
                                                                                          Pfam; PF00106; adn_s....

Pfam; PF00106; adn_s....

PRINTS; PR00080; SDRFAMILY.

PROSITE; PS00061; ADH_SHORT; 1.

Oxidoreductase; NADP; Multigene family; Sporulation;

Oxidoreductase; NADP; MADP (BY SIMILARITY).

BY SIMILARITY.

BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      lactone + NAD(P)H.
-!- SUBUNIT: HOMOTETRAMER.
-!- DEVELOPMENTAL STAGE: EXPRESSED DURING SPORULATION.
-!- MISCELLANEOUS: PREFERS NADP TO NAD.
-!- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           megaterium IAM1030.";
J. Ferment. Bioeng. 70:363-369(1990).
-I- FUNCTION: MAY PLAY SOME ROLE IN SPORE GERMINATION.
-I- CATALYTIC ACTIVITY: Beta-D-glucose + NAD(P)(+) = 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-FEB-1995 (Rel.
01-FEB-1995 (Rel.
01-OCT-1996 (Rel.
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P39482;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacillus megaterium.
Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                                                                               EMBL; D90043; BAA14099.1;
                                                                                                                                                                                                                                                                                                                                                                                                               entities requires a license agreement (See http://www.isb-sib.ch/announce/
or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Okada H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-IAM 1030;
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                                                                                                                                                                                                                                                                                                               PIR; JS0385; JS0385.
HSSP; P50163; 2AE1.
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                                                                                                                                                                                                                                                                                  nterPro; IPR002198; ADH_short.
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51;
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                                               DB 1;
     105;
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                                                     261;
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RESULT 8
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                                                                                                                                                                                                                                                                                                                                                                                                                              "Stability-increasing mutants of glucose megaterium IWG3.";
                                       NP_BIND
ACT_SITE
                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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01-FEB-1995 (Rel. 31, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation updat
Glucose 1-dehydrogenase (EC 1.1.1.47).
                                                                                                                                            EMBL; J04805; AAA22475.1; PIR; A33528; A33528.
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P40288;
                                                                 Oxidoreductase;
                                                                                           PRINTS; PR00080;
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                                                                                PROSITE;
                                                                                                          Pfam; PF00106;
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                                                                                                                     nterPro; IPR002198; ADH_short.
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lactone + NAD(P)H.
SUBUNIT: DOWN-
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SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
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                                                                1; ADH_SHORT; 1.
NADP; Multigene family;
                                                                                           SDRFAMILY
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Beta-D-glucose + NAD(P)(+) - D-
NADP (BY SIMILARITY).
BY SIMILARITY STABLE.
E-A,G,K: HEAT STABLE.
D-N: HEAT STABLE.
V->A: HEAT STABLE.
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Best Local S
Matches 86
                                                                                                                                                                                                                                     WEDLINE-91224127; PubMed-2026158; Yin S.-J., Vagelopoulos N., Lundquist G., Joernvall H.; "Pseudomonas 3 beta-hydroxysteroid dehydrogenase. Primary and relationships to other steroid dehydrogenases."; Eur. J. Biochem. 197:359-365(1991).
                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-93176721; PubMed-8382516;
Abalain J.H., dl Stefano S., Amet Y., Quemener E.,
Abalain Colloc M.L., Floch H.H.;
*Cloning, DNA sequencing and expression of (3-17)beta hydroxysteroid dehydrogenase from Pseudomonas testosteron1.*;
J., Steroid Biochem. Mol. Biol. 44:133-139(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JBHD_COMTE STANDARD; PRT; 253 AA. P19871; 01-FEB-1991 (Rel. 17, Created) 01-FUB-1995 (Rel. 32, Last sequence update) 15-JUL-1999 (Rel. 38, Last annotation update) 3-beta-hydroxysteroid dehydrogenase (EC 1.1.1.51). Comamonas testosteroni (Pseudomonas testosteroni). Bacteria; Proteobacteria; beta subdivision; Comamona
                                                                                                                  MEDIINE-96184891; PubMed-8617258;
Benach J., Knapp S., Oppermann U.C.T., Haegllund O.,
Ladenstein R.;
                                                                         hydroxysteroid
                                                                                                                                                                                   STRAIN-ATCC 11996;
                                                                                                                                                                                                          CRYSTALLIZATION
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                           236:144-148(1996).
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Testosterone + NAD(P)(+) =
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from Comamonas
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                                                                                     DHGA_BACME
P10528;
                            Glucose 1-dehydrogenase
                                            01-OCT-1989
01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Fatty acid biosynthesis; Oxidoreductase; NADP; Com
NP_BIND 10 34 NADP (BY SIMILARITY).
ACT_SITE 154 154 BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collab between the Swiss Institute of Bioinformatics and the EMBL outst the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               genome sequence of Thermo Nature 399:323-329(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-MSB8 / DSM
MEDLINE-99287316;
Nelson K.E., Clayt
    Bacillus
                                                                         01-OCT-1989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      InterPro; IPR002198;
                                                                                                                                                                                                                                                                                            122
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                                                                                                                                                                         236 QVIGIDGG
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NADP(+) = 3-oxoacyl-[acyl-carrier protein] + NADPH.
PATHWAY: FIRST REDUCTION STEP IN THE FATTY ACID BIOSYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
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                                                                                                                                                                                                      SEFVVDGG
                                                                                                                                                                                                                                             VNTVHPGYIKTPLVDDLP--GAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATG
                                                                                                                                                                                                                                                                                                         RLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVR 182
                                                                                                                                                                                                                                                                                                                                                                         DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
                                                                                                                                                                                                                                                                                                                                                                                                   RLEGKYCLITGAASGIGKATTLLFAQEGATVIAGDISKENLDSLYKEAEGLPGKYDPYVL
                                                                                                                                                                                                                                                                                                                                                                                                                           RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSV-GTPDQIQFFQH 62
                                                                                                                                                                                                                                 VNAVAPGFIETPMTEKLPEKARETALS---RIPLGRFGKPEEVAQVILFLASDESSYVTG
                                                                                                                                                                                                                                                                                       QMVVPYMIKQRNG-SIVNVSSVVGIYGNPGQTNYAASKAGVIGMTKTWAKELAGR--NIR
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87; Conserv
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; PS00061; ADH_SHORT; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            s requires a license agreement () an email to license@isb-sib.ch)
 megaterium
           (Rel. 12, Created)
(Rel. 12, Last sequence update)
(Rel. 34, Last annotation update)
*a-hvdrogenase A (EC 1.1.1.47).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        246 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                     248
                                                                                                    STANDARD;
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ton R.A., Gill S.R.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 365.5; DB Pred. No. 7.3e-23
                                                                                                    PRT;
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m K.A.,
M.Y.
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Best Local S
Matches 82
                                          PU/yyy,
01-AUG-1988 (Rel. 08, Created)
01-OCT-1989 (Rel. 12, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation update)
                                                                                                       DHGB_BACME P07999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         between the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There are use by non-profit institutions as large modified and this statement is not removed. Use entities requires a license agreement (See http: or send an email to license@isb-sib.ch).
     Bacteria; Firmicutes;
                                       GDHB
                                                                                                                                   BACME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRINTS; PR00080; SDRFAMILY.

PROSITE; PS00061; ADH SHORT; 1.

Oxidoreductase; NADP; Multigene family.

NP_BIND 11 35 NADP (BY SATELLAR ACT_SITE 158 158 BY SIMILAR
NCBI_TaxID=1404;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Identification and isolation of glucose dehydrogenase genes of Bacillus megaterium M1286 and their expression in Escherichia co
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE-88271315; PubMed-3134196;
Heilmann H.J., Maegert H.J., Gassen H.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-M1
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                                                                                                                                                                                                                                                                                                                           112
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                                                                                                                                                                                                                                                                                               114 DTNLTGAFLGSREAIKYFVENDIKGNVINMSSVHEMIPWPLFVHYAASKGGMKLMTETLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ofam; PF00106; adh_short;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          InterPro; IPR002198; ADH_short.
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                                                                                                                                                                                                                                                                                                                       AVNLDGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAA 171
                                                                                                                                                                                                                                                                                                                                                   -----IVQGDVTKEEDVVNLVQTAIKEFGTLDVMINNAGVENPVPSHELSLDNWNKVI 113
                                                                                                                                                                                         ASSQASYVTGITLFADGGMT
                                                                                                                                                                                                                                                                                                                                                                           GTPDQIQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLL 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       J. Biochem. 174:485-490(1988).
                                                                                                                                                                                                                                           LEYAPK--GIRVNNIGPGAMNTPINAEKFADPEQRADVESMIPMGYIGKPEEVAAVAAFL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                     STANDARD;
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158 B
; 28187 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28.2%; Score 363.5; 31.5%; Pred. No. 1.
           Bacillales; Bacillaceae;
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                                                                                                                                                                                       251
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SIMILARITY.
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PRINTS; PR00080; SDRFAMILY.
PROSITE: PS00061; ADH_SHORT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=84004396; PubMed=6413208; Ulmer W., Froschle M., Jany K.-D.; "Evidence for an essential histidine residue in from Bacillus megaterium and sequence analysis olabeled with bromoacetyl pyridine."; Eur. J. Blochem. 136:183-194(1983).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 27-204.
MEDLINE-84004396; Po
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Heilmann H.J., Maegert H.J., Gassen H.G.;
"Identification and isolation of glucose dehydrogenase genes of Bacillus megaterium M1286 and their expression in Escherichia control of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the s
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SEQUENCE.
MEDLINE-84108870: PubMed-6420184;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eur. J. Biochem.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished results,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE-88271315;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEBS Lett. 165:6-10(1984).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jany K.-D., Ulmer W., "Complete amino acid:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-88271315; PubMed-3134196;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SUBUNIT: HOMOTETRAMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (SDR) FAMILY
EAIAVKGDVTVESDVINLVQSAIKEFGKLDVMINNAGMENPVSSHEMSLSDWNKVIDTNL
                                        QIQFFQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNL
                                                                                                                   MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMIT-----DRHSDVGEKAAKSVGTPD
                                                                                MYKDLEGKVVVITGSSTGLGKSMAIRFATEKAKVVVNYRSKEDEANSVLEEEIKKVG--G
                                                                                                                                                                                         Similarity
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7; S01227.
8; A20238.
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8; C20238.
8; D20238.
0; A23260.
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262
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                                                                                                                                                                      Conservative
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                                                                                                                                                                                                                                                    AA;
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m. 174:485-490(1988).
                                                                                                                                                                                                                                                                                                           1; ADH_SHORT; 1.
NADP; Multigene family;
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28347
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FO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                  MW.
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T., Gassen
                                                                                                                                                                    51;
                                                                                                                                                             Score 360; DB 1;
Pred. No. 2.2e-22;
1; Mismatches 106
                                                                                                                                                                                                                                                                     NADP (BY SIMI)
BY SIMILARITY
                                                                                                                                                                                                                                             C9281328D634E789 CRC64;
                                                                                                                                                                                                                                                                                     amily; Sporulation.
(BY SIMILARITY).
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MEDLINE-98044033; PubMed-yuvv...

( MEDLINE-98044033; PubMed-yuvv...

A Kunst F. Ogasäwara N., Moszer I., Albertini A., Borchert S.,

A Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,

A Brouriss R., Boursler L., Brans A., Braun M., Brignell S.C., Bron S.,

RA Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,

RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,

RA Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T.,

RA Entian K.D., Errington J., Fabret C., Ferrari E., Foulger D.,

RA Ghim S.Y., Glaser P., Goffeau A., Golleron N., Gallezon N.,

RA Ghim S.Y., Glaser P., Goffeau A., Gollghtly E.J., Grandi G.,

RA Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A.,

Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,

Toris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,

Toris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,
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01-OCT-1989 (Rel. 1
30-MAY-2000 (Rel. 3
15-JUN-2002 (Rel. 4
                                                                                                                                                                                                                                                                                                                                                                                                                                         determination of the
  of 113 genes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Firmicutes; NCBI_TaxID=1423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30-MAY-2000 (Rel. 39, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Glucose 1-dehydrogenase (EC 1.1.1.47).
                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                          Microbiology 142:3047-3056(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                "The 25 degrees-36 degrees region of the Bacillus subtilis determination of the sequence of a 146 kb segment and ident
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-97124189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
STRAIN=168;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A. MEDLINE-86168021;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacillus subtilis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dehydrogenase gene.";
eriol. 166:238-243(1986).
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M., Kurita K.;
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ani B., Chaudhry
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y regulated Bacillus subtilis
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Yata K., chin A.;
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EMBL; D50453; BAA09024.1; -.
EMBL; Z99106; CAB12201.1; -.
PIR; S36090; S36090.
HSSP; P50162; 1AE1.
SubtiList; BG10545; gdh.
InterPro; IPR002198; ADH_short.
                                                                                                                                                                                                                                                                      BACME
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                                                                                                                       01-FEB-1995 (Rel. 31, Created)
01-FEB-1995 (Rel. 31, Last seq
01-OCT-1996 (Rel. 34, Last ann
01-OCSe 1-dehydrogenase IV (EC
                                       Bacillus megaterium.
Bacteria; Firmicutes;
NCBI_TaxID=1404;
SEQUENCE FROM N.A
                                                                                                                                                                                                                       DHG4_BACME
P39485;
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Nature 390:249-256(1997).
Nature 390:249-256(1997).
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CATALYTIC ACTIVITY: Beta-D-glucuse
Lactone + NAD(P)H.

SUBUNIT: HOMOTETRAMER.

- INDUCTION: IT IS INDUCED AT STAGE III OF THE SPORULATION.

- INDUCTION: TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
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148
                                                                                                                                                                                                                                            STANDARD;
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ADP; Sporulation;
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158
150
28090 MW;
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                                                            Bacillales;
                                                                                                                            sequence update)
annotation updat
(EC 1.1.1.47) (G
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Pred. No. 2.9e
45; Mismatches
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NADP (BY SIMILARITY).

BY SIMILARITY.

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5894C17DB8F14965 CRC64;
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                                                            Bacillaceae;
                                                                                                                            n update)
                                                                                                                                                                                                                                            261
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KESULT 15
DHG2_BACME
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Best Local (
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ACT_SITE
SEQUENCE
                                                                                                     01-FEB-1995 (Rel. 31, Created)
01-FEB-1995 (Rel. 31, Last seq
01-OCT-1996 (Rel. 34, Last ann
Glucose 1-dehydrogenase II (EC
                                                 Bacillus megaterium.
Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Oxidoreductase; NAD; Multigene family.

NP_BIND: 11 35 NAD (BY SIMILARITY).

ACT_SITE 158 158 BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Cloning, nucleotide sequences, and enzymatic propert dehydrogenase isozymes from Bacillus megaterium IAM10 J. Bacteriol. 174:5013-5020(1992).
-!- CATALYTIC ACTIVITY: Beta-D-glucose + NAD(P)(+) - lactone + NAD(P)H.
-!- SUBUNIT: HOMOTETRAMER.
-!- MISCELLANEOUS: PREFERS NAD TO NADP; 2M NACL ENHAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=IAM 1030;
MEDLINE=92332436; PubMed=1629157;
Mitamura T., Wang X.H.,
SEQUENCE FROM N.A
                                NCBI_TaxID=1404;
                                                                                       CDHII
                                                                                                                                                                                               DHG2_BACME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRINTS; PR00080; SDRFAMILY.
PROSITE; PS00061; ADH_SHORT; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entities requires a license agreement (S or send an email to license@isb-sib.ch);
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between the Swiss Institute of Bioinformatics and the EMBL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the European Bioinformatics Institute.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AVNLDGVFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAA: 171
                                                                                                                                                                                                                                                                                                                                                             LEYAPK -- GIRVNNIGPGAMNTPINAEKFADPVQRADVESM --
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85; Conserv
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28157 MW;
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32.1%;
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                                                                                                     sequence update) annotation update) (EC 1.1.1.47) (GLC
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Pred. No. 3.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL: D90044; BAA14100.1; -.
HSSP; P50162; 1AE1.
InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
PRINTS; PR00080; SDRFAMILY.
PROSITE; PS00061; ADH_SHORT; 1.
OXIGOTEGUCTASE; NADP; Multigene family.
NP_BIND
11
35
NADP (BY SIMILARITY).
ACT_SITE
158
BY SIMILARITY.
SEQUENCE
261 AA; 28251 MW; CEF9AA1425D2999C CRC64;
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-- SUBUNIT: HOMOTETRAMER.
-- NISCELLANEOUS: PREFERS NADP TO NAD.
-- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (see or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Structure of isozyme genes of glucose dehydrogenase from Bacillus megaterium IAM1030.";
J. Ferment. Bloeng. 70:363-369(1990).
-I- CATALYTIC ACTIVITY: Beta-D-glucose + NAD(P)(+) - D-glucono-1,5-
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Mitamura T., Ebo
237 SYVTGITLFADGGMT 251
                                        236 KFATGSEFVVDGGYT 250 : || | | | |
                                                                                                                               179
                                                                                                                                                                                       177
                                                                                                                                                                                                                                     119 GAFLGSREAIKYFVENDIKGNVINMSSVHEMIPWPLFVHYAASKGGMKLMTETLALEYAP 178
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                                                                                                               K--GIRVNNIGPGAIDTPINAEKFADPEQRADVESMIPMGYIGKPEEIASVAAFLASSQA 236
                                                                                                                                                                 KDYDVRVNTVHPGYIKTPL-VDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNES 235
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MYTDLKDKVVVVTGGSKGLGRAMAVRFGQEQSKVVVVNYRSNEEEALEVKKEIEEAG--GQ 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ebora R.V., Nakai T., Makino Y., Negoro S., Urabe I.,
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Search completed: April 22, 2003, 17:15:45 Job time : 15 secs

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Title:
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Listing first 45 summaries
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Maximum DB seq length: 2000000000
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                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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Gapop 10.0 , Gapext 0.5
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1483.539 Million cell updates/sec
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                                                                                                                      sp_vertebrate:*
sp_unclassified:*
sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
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SUMMARIES
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| 373 | 374.5 | 374.5 | 376.5 | 378.5 | 386.5 | 386.5 | 885 | 391 | 395.5 | 411 | 411 | 427.5 | 438 | 452.5 | 470 | Score | |
| 28.9 | 29.0 | 29.0 | 29.2 | 29.3 | 30.0 | 30.0 | 30.1 | 30.3 | 30.7 | 31.9 | 31.9 | 33.1 | 34.0 | 35.1 | 36.4 | Match I | * Query |
| 249 | 250 | 248 | 255 | 258 | 251 | 247 | 260 | 249 | 256 | 254 | 251 | 244 | 254 | 250 | 261 | Match Length DB | |
| N | 16 | 16 | 16 | N | N | N | 17 | N | N | N | | N | 16 | N | 16 | | |
| Q9LBG5 | Q98C63 | 031680 | . Q98ENO . | Q9JN17 | Q9F7E0 | Q93RMO | Q8U3B3 | Q56841 | Q93QG5 | Q52587 | Q9RNK5 | Q8VLS3 | Q9K4G9 | Q937L4 | Q9ABI1 | ID | |
| | Q98c63 rhizobium l | O31680 bacillus su | Q98en0 rhizobium 1 | Q9jn17 agrobacteri | Q9f7e0 acinetobact | Q93rm0 acinetobact | Q8u3b3 pyrococcus | Q56841 xanthobacte | Q93qg5 brevibacter | Q52587 comamonas t | Q9rnk5 zymomonas m | Q8vls3 xanthobacte | Q9k4g9 streptomyce | Q93714 comamonas t | Q9abil caulobacter | Description | |

Query Match

36.4%; Score 470;

DB 16;

Length 261;

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| EMBL; AEÓ05698; AAK22233.1; HSSP; P19992; 1HDC. TIGR; CC0246; InterPro; IPRO02198; ADH_short. Pfam; pr00106; adh_short; 1. PRINTS; PR00080; SDRFAMILY. PROSITE; PS00061; ADH_SHORT; UNKNOWN_1. Oxidoreductase; Complete proteome. SEQUENCE 261 AA; 27011 MW; CE011D872D4EBA6D CRC64; | NCBL_TaxID=155892; [1] SEQUENCE FROM N.A. SEQUENCE FROM N.A. STRAIN-ATCC 19089 / GB15; MEDLINE=21173698; PubMed=11259647; MEDLINE=21173698; PubMed=11259647; Nierman W.C., Feldblyum T.V., Laub M.T., Ohta N., Maddock J.R., Potocka I., Nelson W.C., Newton A., Stephens C., Phadke N.D., Ely B., Potocka I., Nelson W.C., Newton A., Stephens C., Haft D.H., Eisen J., Heidelberg J.F., Alley M.R.K., Ohta N., Haft D.H., Potocka I., Nelson W.C., Newton A., Stephens C., Haft D.H., Kolonay J.F., Smit J., Craven M.B., Khouri H., Shetty J., Berry K., Utterback T., Tran K., Wolf A., Vanathevan J., Ermolaeva M., White O., Salzberg S.L., Venter J.C., Shapiro L., Fraser C.M.; "Complete genome sequence of Caulobacter crescentus."; Proc. Natl. Acad. Sci. U.S.A. 98:4136-4141(2001)i- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES (SDR) FAMILY: | II 1 Q9ABI1 PRELIMINARY; PRT; 261 AA. Q9ABI1; O1-JUN-2001 (TrEMBLrel. 17, Created) O1-JUN-2001 (TrEMBLrel. 20, Last sequence update) O1-MAR-2002 (TrEMBLrel. 20, Last annotation update) 2.5-dichloro-2.5-cyclohexadiene-1,4-diol dehydrogenase. CC0246. CC0246. Proteobacteria; alpha subdivision; Caulobacter group; Caulobacter. |

Matches 107; Conser

Conservative

46;

40.78;

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SEQUENCE FROM N.A.

STRAIN-NCIMB 9872;

van Beilen J.B., Fritsche U., Seeger M., Smits T.H.M., Witho "Cloning of Baeyer-Villiger monooxygenases from Comamonas, xanthobacter and Rhodococcus via PCR with highly degenerate Submitted (NOV-2001) to the EMBL/GenBank/DDBJ databases.

-I- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/RE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Comamonas testosteroni (Pseudomonas testosteroni).
Bacteria; Proteobacteria; beta subdivision; Comamonadaceae;
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                                                          VNSVHPGVIATPMTQQILDAPQSARALLGPTLLGRAAQPMEVSQAVLFLVSDEASFVHGS
                                                                                                       VNTVHPGYIKTPLVDD-LPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATGS
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Oxidoreductase.
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Cerdeno A.M.,
Submitted (JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Challis G.L., Thomson N.R., James K.D., Harris D.E., Quali M.A., Kieser H., Harper D., Bateman A., Brown S., Chandra G., Chen C.W., Collins M. Cronin A., Fraser A., Goble A., Hidalgo J., Hornsby T., Howarth S. Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S., Rabbinowitsch E., Rajandream M.A., Rutherford K., Rutter S., Seeger K., Saunders D., Sharp S., Squares R., Squares S., Taylor K., Seeger K., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J., Worren T., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Complete genome sequence of the model actinomycete Streptomyces coelicolor A3(2).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces coellcolor.

Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces.
NCBI_TaxID=1902;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9K4G9;
01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-JUN-2002 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00106; adh_short; 1.
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Redenbach M., Kieser H.M., Denapa
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                                                  SDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTRL 124
                                                                                                  LTGKNVIITGGARGLGAEAARQAVAAGAHVLITDVLDDDGENAARELG--DRARFLHHDV
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EMBL/GenBank/DDBJ databases.
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Pred. No. 6.6e-25;
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RESULT 2 Q937L4

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Query Match Best Local 9 Matches

Similarity

35.1%;

Conservative

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SEQUENCE

250 AA; 26626 MW;

EMBL; AJ418060; CAD10799.1; ...
InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
Oxidoreductase.

(SDR) FAMILY

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RESULT 5
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ID Q9RN
AC Q9RN
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                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
   Q9RNK5;
Q9RNK5;
01-MAY-2000
01-MAY-2000
01-DEC-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          van Beilen J.B., Fritsche U., Seeger M., Smits T.H.M., Wil "Cloning of Baeyer-Villiger monoxygenases from Comamonas Xanthobacter and Rhodococcus via PCR with highly degeneral Submitted (NOV-2001) to the EMBL/GenBank/DDBJ databases. EMBL; AJ418061; CAD10802.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q8VLS3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Proteobacteria;
Hyphomicrobium group; Xani
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                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                              Oxidoreductase.
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRINTS; PR00080; SDRFAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-ZL5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=281;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Xanthobacter flavus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cyclohexanol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-MAR-2002
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                                                                                                                                                                                                                                                                                                                              4 RLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKS-VGTPDQIQFFQH 62
                                                                                                                                     FATGSEFVVD 246
                                                                                                                                                                           VNTVHPGYIKTPLVDDL----PGAEEAMSQRT--KTPMGHIGEPNDIAYICVYLASNESK 236
                                                                                                                                                                                                                      RLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVR 182
                                                                                                                                                                                                                                                        DVTKESDWAAAVDTVKAKSGKLNVLVNNAGILVLKPAHETTNDEWDSTFNVNVRGVWLGI 122
                                                                                                                                                                                                                                                                      DSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGT 122
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TVHPGYIKTPLVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESKFATGSEFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVPALKEAG-GGSIVNISSAAGLMGLALTAGYGASKWGVRGLTKIGAVEWGTA--RVRVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FVHGAEMVVD
                                                                                                                                                            VNSVHPGVIDTPMTKDLLHGDPAARKAIMGATLFDRPC---
                                                                                                                                                                                                          RSFVPLM--KGNNGSIINISSIYGIVGAPMAGAYIASKGAVRLLTKSCAVD--LIQFGIR
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                                                                                                                                                                                                                                                                                                                                                        103;
                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                      244 AA;
  (TrEMBLrel. 13, (TrEMBLrel. 13, (TrEMBLrel. 19,
                                                                                                                                                                                                                                                                                                                                                        Conservative
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                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TrEMBLrel. 20, Last sequence update) (TrEMBLrel. 21, Last annotation update) dehydrogenase (EC 1.1.1.1) (Fragment).
                                                                                                               244
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25550 MW; 01FC9B7101CC1B8F CRC64;
                                                                                                                                                                                                                                                                                                                                                                 33.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ia; alpha subdivision; Rhizobiaceae Xanthobacter.
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21,
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Last sequence update)
Last annotation update)
                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
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                                                                                                                                                                                                                                                                                                                                                                Score 427.5; D
Pred. No. 3.8e-
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Best Local
                                                                                                                                                                                                                        SEQUENCE FROM N.A.

STRAIN-ATCC 11996;
Cabrera J.E., Genti-Raimondi S.;
Cabrera J.E., Genti-Raimondi S.;
Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases
-i- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q52587
Q52587;
                                                                                                                                                                                                                                                                                                                                                                                              Comamonas testosteroni (Pseudomonas testosteroni).
Bacteria; Proteobacteria; beta subdivision; Comamonadaceae;
NCBI_TaxID=285;
                                                                                                                                                                                                                                                                                                                                                                                                                                        Peta-hydroxysteroid dehydrogenase.

Commamonas testosteroni (Pseudomonas testosteroni).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1996 (TrEMBLrel. 01, 01-NOV-1996 (TrEMBLrel. 01, 01-DEC-2001 (TrEMBLrel. 19,
SEQUENCE
                   PROSITE; PS00061; ADH_SHORT; UNKNOWN_1.
                                                                          InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
PRINTS; PR00080; SDRFAMILY.
                                                                                                                                                     EMBL; U41265; AAA25742.1; -. HSSP; P19992; 1HDC.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; alpha subdivision;
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Pfam; PF00106;
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                                                                                                                                                                                                             (SDR) FAMILY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVRVNTVH 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FVVDGGYTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGYIKTPLVDDLPGAEEAMSQRTK-----TPMGHIGEPNDIAYICVYLASNESKFATGSE 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AMKNKGTG-SIINISSRSGLVGIPLAAAYASSKAAIRNHSKSVALYCAQQGWKIRCNAIN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FDATEKAFGPVSTLVNNAGI-----AVNKSVEETTTAEWRKLLAVNLDGVFFGTRLGIQ 127
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0106; adh_short; 1.
254 AA;
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26952 MW;
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Last annotation update)
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Pred. No. 6.6e-23
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FB6EC90B151975DB CRC64;
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                                                                                                                                                                                                                                      DEHYDROGENASES/REDUCTASES
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
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RESULT
Q93QG5
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-DEC-2001
01-DEC-2001
01-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                              Brzostowicz P.C., Blasko M.S., Rouviere "Identification of Two Gene Clusters Inv Brevibacterium sp. HCU.";
Submitted (DEC-2000) to the EMBL/GenBank
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q93QG5;
                                                                                                                                                                                                                                                                                                                                          EMBL; AF257214; AAK73164.1; -.
InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Brevibacterium sp. HCU.
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cyclohexanol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-HCU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID-133406;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Actinomycetales; Micrococcineae;
                        179
                                          181 VRVNTVHPGYIKTPLV------DDLPGAEEAMSQRTKTPMGHIGEPNDIAYICVYLAS 232
                                                                               122
                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EQUENCE FROM N.A.
                                                                                                                                         62
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                                                                                                                                                                                                                                                                                                                                                                                               nitted (DEC-2000) to the EMBL/GenBank/DDBJ databases.
SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                            GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD 180
                                                                                                                                                                                                                                                                                                                                                                                       (SDR)
                                                                                                                                                                                                                   NRLDGKVAIITGGTLGIGLAIATKEVEEGAKVMITDRHSDVGEKAAKSVGTPDQI-QFFQ 61
               IRVNAVAPGTILTPLVKELGSRGPDGLDGYTKLMG--AKHPLGRVGTPEEVAAATLFLAS
                                                                      MTKHCIPYFKQAG-GGAIVNFASIYGLVGSQELTPYHAAKGAVVALTKQDAV--TYGPSN
                                                                                                                                LDVSDESEVETVVSDIAKRFGAINVLVNNAGVTGADKPTHEIDERDLDLVLSVDVKGVFF 121
                                                                                                                                                           HDSSDEDGWTKLFDATEKAFGPVSTLVNNAGI-AVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                        NRLGGKVAVITGGAAGMGRIQSELYASEGAQVAVVDVNEQEGRATADAIRASGGVANYWK 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VMSGSELHAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VRVNTVHPGYIKTPLVD-DLP---GAEEAMSQRTKTPMGHIGEPNDIAYICVYLASNESK 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MSNRLDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDQIQFF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IRVNSIHPDGIYTPMMQASLPKGVSKEMVLHDPKLNRAGRAYMPERIAQLVLFLASDESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCQQGIAAMKE--TGGSIINMASVSSWLPIEQYAGYSASKAAVSALTRAAALSCRKQGYA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYD 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RHDVSSEADWTLVMAAVQRRLGTLNVLVNNAGILLPGDMETGRLEDFSRLLKINTESVFI 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFF 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
92; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                       FAMILY.
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                                                                                                                                                                                                                                                       Conservative
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                                                                                                                                                                                                                                                                                                                AA;
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                                                                                                                                                                                                                                                                   Score 395.5;
Pred. No. 9.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
Last sequence update)
Last annotation updat
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Pred. No. 6.7e-23;
8; Mismatches 102;
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                                                                                                                                                                                                                                                                                                            C483D9F6BD8D1836 CRC64;
                                                                                                                                                                                                                                                      Mismatches
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Brevibacteriaceae; Bre
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Involved
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Best Local Similarity
               O8UJB3; PRELIMINARY; CRUZINARY; O8UJB3; O1-JUN-2002 (TrEMBLrel. 21, Created)
O1-JUN-2002 (TrEMBLrel. 21, Last sequence update)
O1-JUN-2002 (TrEMBLrel. 21, Last annotation update)
O1-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q56841;
01-NOV-1996
01-NOV-1996
01-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Oxidoreductase.
SEQUENCE 249 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-95219103; PubMed-7704278;
Swaving J., Weijers C.A.G.M., van Ooyen A.J.J.,
"Complementation of Xanthobacter PY2 mutants in
degradation; expression and nucleotide sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Xanthobacter sp. (strain Py2).
Bacteria; Proteobacteria; alpha subdivision;
Hyphomicrobium group; Xanthobacter.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRINTS; PRODO80; SDRFAMILY.
PROSITE; PSO0061; ADH_SHORT; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; X79863; CAA56245.1; HSSP; P19992; 1HDC.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00106; adh_short;
PRINTS; PR00080; SDRFAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Microbiology 141:477-484(1995).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hyphomicrobium group;
NCBI_TaxID=78245;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA fragment.
                                                                                                                                                                            237
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        237
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                                                                                                                                                                                        GSEFVVDGGYTA 251
                                                                                                                                                                                                                                                                                                       GIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDVDVRVN 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (SDR) FAMILY
                                                                                                                                                                                                                                               TVHPGYIK-TPLVDDLPGAE---EAMSQR-TKTPMGHIGEPNDIAYICVYLASNESKFAT
                                                                                                                                                                         GSVLAVDGGMTA 248
                                                                                                                                                                                                                            VVCPGTVAGTDMGRQLLGTDCDPELEARRLAKYPMGRFGTPEDIAEAAVFLLSTKAAFVT
                                                                                                                                                                                                                                                                                     TDEAAITAAMAGAQRALGPLTGLVNNAGIAGFGSVHATEVETWSRIMAVNVTGTFLASKA 119
                                                                                                                                                                                                                                                                                                                                                              SDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTRL 124 ::| | | | :::| | | | :::
                                                                                                                                                                                                                                                                                                                                                                                                                     LDGKVAIITGGTLGIGLAIATKFVEEGAKVMITDRHSDVGEKAAKSVGTPDØIQFFQHDS 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NESKFATGSEFVVDGGYTAQ
|:|||:|||||
EEASFITGAVLPVDGGYTAQ
furiosus
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38.9%;
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Last sequence update)
Last annotation update)
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Pred. No. 2e-21;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 249
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of the compleme
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                                                                                                                                                                                                                                                                                       "Identification and Characterization of Cyclohexanol Met
from Acinetobacter sp. NCIMB 9971.";
Submitted (APR-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                   SEQUENCE
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PROSITE; PS00061; ADH_SHORT; UNKNOWN_1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Acinetobacter sp. SE19.
Bacteria; Proteobacteria;
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                                                                      DKGIRINSVHPGYIKTPLIAEFEEAEMVKLH----PIGRLGQPEEVAQVVAFLLSDDASF
                                                                                                    VFYSMHYEVPAILAAG-GGAIVNTASIAGLIGIQNISGYVAAKHGVTGLTKAAALEYA--
                                                                                                                                                                                                                VFFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALK 177
                                                                                                                                                                                                                                                                                                                   FQHDSSDEDGWTKLFDATEKAFGPVSTLVNNAGI--AVNKSVEETTTAEWRKLLAVNLDG 117
                                                                                                                                                                                                                                                                                                                                                                     MSNKFNNKVALITGAGSGIGKSTALLLAQQGVSVVVSDINLEAAQKVVDEIVALGGKAAA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DKGIRINSVHPGYIKTPLIAEFEEAEMVKLH---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IPR002198; ADH_short.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      30.0%; Score 386.5; DB 2
33.7%; Pred. No. 4.3e-21;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      subdivision;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                251
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Best Local
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PROSITE; PS00061; ADH_SHORT; UNKNOWN_1.
Oxidoreductase; Plasmid.
SEQUENCE 258 AA; 27591 MW; B4E4D036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9JN17;
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Octopine-type Ti plasmid sequence.";
Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases.
-I- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ly1 S.M., Jafri S., Winans S.C.;
"Mannopinic acid and agropinic acid catabolism region of the octopine-
type Ti plasmid pT115955.";
Mol. Microbiol. 31:339-347(1999).
    241
                                             235
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 4-258 FROM N.A. MEDLINE-99141607; Pubmed-9987134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Ti plasmid-encoded genes responsible for catabolism of the opine mannopine by Agrobacterium tumefaciens are homologs region genes responsible for synthesis of this opine by the contract of the opine of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Agrobacterium tumefaciens 
Plasmid Ti.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        inans S.C., Zhu J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rhizobiaceae;
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                                                                                                                                                                AAIPVMREGGRGA-IVNVGSMSGIVSNIPQNQVAYNSSKAAVHMMTKSLASELALD--NI
                                                                                                                                                                                                                                                     LKTREAACALVKRVADDAGRLDILINNAGIANGGDTPLFTEQQWRDVIATNVETVFWCSQ
                                                                                                                                                                                                                                                                                             SSDEDGWTKLEDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTR 123
                                                                                                                                                                                                                                                                                                                                             RLDGKVALITGGTRGIGLATAYAFGEAGAKLYLSARREEY-EDAGAILTAGYDVTFYPAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (SDR) FAMILY.
                                                                              RVNAVAPGYIDTDM-----SRGGMYHPVRGPIWLEMTPMKRFGRPDEIATAILFLASEA
                                                                                                            RVNTVHPGYIKTPLVDDLPGABEAMSQRTK-----TPMGHIGEPNDIAYICVYLASNE
SSYVTGDILVVDGGYTTR 258
                                       SKFATGSEFVVDGGYTAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AF242881; AAF77146.1;
P50162; 1AE1.
                                                                                                                                                                                                                                                                                                                                                                                                                                             l Similarity
97; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             29.3%; Score 378.5; DB 2; 37.6%; Pred. No. 1.8e-20;
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21,
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                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches 102;
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Q98EN0
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O31680;
O31680;
O1-JAN-1998 (TrEMBLrel. 0
O1-JAN-1998 (TrEMBLrel. 0
O1-MAR-2002 (TrEMBLrel. 2
Bacillus subtilis.
Bacteria; Firmicutes; E
Bacillaceae; Bacillus.
NCBI_TaxID=1423;
[1]
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01-0CT-2001
01-0CT-2001
                                                               YKVO protein.
YKVO.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA Res. 7:331-338(2000).
EMBL; AP003003; BAB50888.1; -
InterPro; IPR002198; ADH_short.
Pfam; PF00106; adh_short; 1.
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MEDLINE-21082930; PubMed-11214968;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS; PR00080; SDRFAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rhizobium loti (Mesorhizobium loti).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae
Phyllobacteriaceae; Mesorhizobium.
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Kishida Y., Kiyokawa C., Kohara M., Mati
Wochizuki Y., Nakayama S., Nakazaki N.,
Takeuchi C., Yamada M., Tabata S.;
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                                                                                                                                                                                                                                                                                                                                                                                                                                1 MSNRLDGKVAIITGGTLGIGLAIATKEVEEGAKVMITDRHSDVGEKAAKSVGTEDQI-QF
                                                                                                                                                                                                         LYLASDESSEVNGAHLEVDNGFTA
                                                                                                                                                                                                                     VYLASNESKFATGSEFVVDGGYTA
                                                                                                                                                                                                                                                        RNIRCNAVCPGFIRTPHGLREVADLGKLGVDVSDAALAAQQ
                                                                                                                                                                                                                                                                                                           FLMTRAVLPGMIAAG-GGSIVCTSSISAVAATPMEVLYDTTKGACHMFARAIAVE--FRD 176
                                                                                                                                                                                                                                                                                                                                                                                                                MGERLAGKVAIISGGATGMGGAASELFAAEGAKVAIIDRNGEAAAATAAAIRARGRVAEH 60
                                                                                                                                                                                                                                                                                                                                                             FVADVSDEAQVQAAVKGATEK-LGPVTVLFNHAGTIVIKPFLETTVQEWDWLHAVNVRSM 119
                                                                                                                                                                                                                                                                               YDVRVNTVHPGYIKTP------LVDDLPGAEEAMSQRTKTPMGHIGEPNDIAYIC
                                                                                                                                                                                                                                                                                                                                  FFGTRLGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKD 178
                                                                                                                                                                                                                                                                                                                                                                                     FOHDSSDE-DGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGV 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         101;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
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                                Bacillus/Clostridium group; Bacillales;
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05,
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                                                                                   Created)
Last sequence update)
Last annotation update;
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Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 376.5; DB 1
Pred. No. 2.5e-20;
7; Mismatches 103
                                                                                                                                          PRT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nitrogen-fixing symbiotic bacterium
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RA Fritz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Gallaron N.,
RA Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G.,
RA Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
Joris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,
RA Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M.,
RIIITA K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Lee S.M., Levine A., Liu H., Masuda S., Mauel C., Medigue C.,
RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S.,
Noback M.,
RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S.,
RA Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
RA Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S.,
RA Rigger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,
RA Sato T., Scanlan E., Schleich S., Schroeter R., Scoffone F.,
Sato T., Scanlan E., Schleich S., Schroeter R., Scoffone F.,
Sakiguchi J., Sekowska A., Seror S.J., Serror P., Shin B.S., Soldo B.,
Sorokin A., Tanconi E., Takagi T., Takahashi H., Takemaru K.,
Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Tognoni A.,
Van Yasi A., Wambutt R., Wedler E., Wedler H., Weitzenegger T.,
The Complete Genome Sequence of the Gram-postitive Meatering Deathin A.;
The Complete Genome Sequence of the Gram-postitive Meatering Deathin A.;
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Best Local
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Oxidoreductase; Complete proteome.
SEQUENCE 248 AA; 26245 MW; EAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G., Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S., Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S., Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M., Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M., Chol S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., Chol S.K., Codani J.J., Connerton I.F., Cummings N.J., Emmerson P.T., Epilan K.D., Erminiton J. Fabret C. Ferrari F. Epilar P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; 299111; CAB13250.1; -. HSSP; P47227; 1BDB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kunst F., Ogasawara N., Yoshikawa H., Danchin A.;
Submitted (NOV-1997) to the EMBL/GenBank/DDBJ databases.
-i- SIMILARITY: BELONGS TO THE SHORT-CHAIN DEHYDROGENASES/REDUCTASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "The complete genome subtilis.";
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-168;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               InterPro; IPR002198; ADH_short.
                                              241
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                                                                                                                                                                                                                  EQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                  (SDR) FAMILY
                                                                                                                                                                                                                                                                                                                                   SSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTR 123
VELFVDGG
                                              SEFVVDGG 248
                                                                                                                                     NTVHPGYIKTPLVDDLPG--AEEAM-SQRTKTPMGHIGEPNDIAYICVYLASNESKFATG
                                                                                                                                                                                      KALSLFPDK--VGSIIVTGSTAGSIGNPAFSVYGASKAALRALVRNWILD--LKGTEIRV
                                                                                                                                                                                                                                                                                        ISKLEDLDKLYDIIKQEKGKLDILFANAGIGNFLPLGEITEEQVDRTFDINVKGTIFTVQ
                                                                                         NVVSPGGILTPAYDELFGDALEEVLENSRNTVPAGKVGTPEEVANAVSFLASDESSYLTG
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Mismatches 106
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Search completed: April 22, Job time : 38 secs
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Matches 93
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01-OCT-2001
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                                                                                                                                                                                                                                                                                                                                                                                      Complete proteome. SEQUENCE 250 AA; 26407 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AP003006; BAB51758.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kaneko T., Nakamura Y., Sato Ś., Asamizu E., Kato T., Sasamoto Watanabe A., Idesawa K., Ishikawa A., Kawashima K., Kimura T., Kishida Y., Kiyokawa C., Kohara M., Matsumoto M., Matsuno A., Mochizuki Y., Nakayama S., Nakazaki N., Shimpo S., Sugimoto M. Takeuchi C., Yamada M., Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-MAFF303099;
MEDLINE-21082930; PubMed-11214968;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rhizobium loti (Mesorhizobium loti).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
Phyllobacteriaceae; Mesorhizobium.
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                                                                                                                                                                                                                                                                                                                                                                                                                            InterPro; IPR002198; ADH_short. Pfam; PF00106; adh_short; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA Res. 7:331-338(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Complete genome structure of the nitrogen-fixing symbiotic bacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mesorhizobium loti.
                                                         236
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                                                                                                                                                                                                                                                                                       ATGSEFVVDGG 248
                                                                                                                                                                                        LGIQRMKNKGLGASIINMSSIEGFVGDPSLGAYNASKGAVRIMSKSAALDCALKDYDVRV 183
                                                                                                                                                                                                                    VSLLEDLDRLYAVVKEKHGHIDVLFANAGAGTIAPLAAATEAHFDQTFDVNVKGLFFTVQ 120
                                                                                                                                                                                                                                               SSDEDGWTKLFDATEKAFGPVSTLVNNAGIAVNKSVEETTTAEWRKLLAVNLDGVFFGTR 123
                                                                                                                                                                                                                                                                      NTVHPGYIKTPLVDDLPG-----AEEAMSQ-RTKTPMGHIGEPNDIAYICVYLASNESKF 237
                                                                                                                                                                 KALPLFKD----GGSIILNSSVSNVLGLPGFSTYAASKAAVRNFSRAWTLE---LKDRKIRV
                                                     VTGVDLAVDGG
                                                                                                          NTMSPGAIETPALETTTGLTPEQAEQAVAQFASQIPMGRRGKPEEIAAAVTFLASDDSSY 235
                                                                                                                                                                                                                                                                                                                                  93;
                                                                                                                                                                                                                                                                                                                                Similarity 37.1
93; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                      246
                                                                                                                                                                                                                                                                                                                              29.0%; Score 374.5; DB 16; 37.1%; Pred. No. 3.4e-20; tive 47; Mismatches 98;
              2003, 17:16:27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Last sequence update)
Last annotation update)
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